

Digitized by the Internet Archive
in 2010 with funding from
CARLI: Consortium of Academic and Research Libraries in Illinois

FOURTH ANNUAL REPORT
OF THE
BOARD OF PUBLIC WORKS
TO THE
COMMON COUNCIL
OF
THE CITY OF CHICAGO.

APRIL 1ST, 1865.

CHICAGO:
GEORGE H. FERGUS, BOOK AND JOB PRINTER,
NO. 12 CLARK STREET.

1865.

BOARD OF PUBLIC WORKS.

MEMBERS OF THE BOARD.

JOHN G. GINDELE, COMMISSIONER AND PRESIDENT.

FREDERICK LETZ, COMMISSIONER AND TREASURER.

ORRIN J. ROSE, COMMISSIONER.

WILLIAM GOODING,	} Members acting in Board only on matters pertaining to cleansing Chicago River.
ROSWELL B. MASON,	

OFFICERS.

A. W. TINKHAM, SECRETARY.

E. S. CHESBROUGH, CITY ENGINEER.

COMMISSIONER'S REPORT.

OFFICE OF THE BOARD OF PUBLIC WORKS, }
CHICAGO, JULY 10, 1865.

*To the Mayor and Aldermen of the City of Chicago, in
Common Council assembled:—*

The Board of Public Works have the honor to report to you their proceedings, and to submit to you detailed exhibits of their expenditures for the fiscal year ending March 31st last. The Board would have been pleased to have brought their report before you more promptly, but a press of current business has delayed its preparation to the present time. We will notice in the same order as usual the various works entrusted to our care, and will endeavor to do so at no greater length than is demanded by their importance.

WATER WORKS.

The past year has been one of unusual expenditures on the Water Works; but the outlay we trust has been attended with results fully compensating for the money spent. Of course, the extraordinary prices of labor and materials have made the running expenses and repairs for the year unusually heavy, and have made all the works entered upon during the year to cost more than in ordinary times. Still, the income from the water rents has been considerably larger than in any previous

year; and we believe that all the expenditures for the operating of the works, and for the various important improvements and additions in progress during the year, have been managed economically. The Board believe that the works are in as thorough a state of repair as at any time previous, and never more efficient. The amount of water consumed is, however, increasing rapidly year by year, and has now nearly equalled the power of the smaller of the two engines, and it is evident that, to ensure maintaining a regular and full supply to the city, another engine must be erected without delay. Of this subject, we shall have occasion to speak more fully before closing this report.

Excepting that it has become necessary from time to time to shut off the water from limited districts for repairs and laying new pipes, the supply to the city was interrupted during the year only for a few hours one night while the pump well was being cleaned out, the reservoirs being kept full in the meanwhile for use in case of fire.

The quality of the water has not always been good, but in general it has been so. The Board do not doubt that the time is not distant when, from the measures now in progress, the water furnished to the city will be quite free from all impurities, except occasionally the slight milkiness imparted to the lake water by storms, which is caused by the clay banks a long distance North of the city, and frequently extends many miles out from the shore.

EXPENDITURES DURING THE YEAR.

COST OF ADDITIONS TO WORKS DURING THE YEAR:—

Tunnel two miles under Lake Michigan,-----	\$106,389.24
New 2 ft. main on Wabash Avenue, from Adams to 22d Street—9817 ft.,-----	81,249.90
11½ miles of distributing water pipes,-----	104,828.50
New engine,-----	7.26
	<hr/>
	\$292,474.90

INTEREST AND OPERATING EXPENSES DURING THE FISCAL YEAR:—

Interest, including \$3,051.01, charged over from discount account, -----	\$77,518.20
Expenses at the pumping works,-----	43,839.95
Improvements, such as West Reservoir iron fence, &c., &c.,-----	5,719.57
Water meters,-----	3,719.05
Repairs and all operating expenses, except at pumping works,-----	42,798.20
	<hr/>
	\$173,594.97

WATER RENTS.

The income from water rents for the year, including \$699.34, the profits of tapping pipes, amounted to \$224,902.57, exceeding that of the year next preceding by \$32,656.18.

A very considerable portion of the tax for the use of water, is now determined by meters. Of the total water rent stated above, the amount of \$31,357 was determined by meters. The Board have in use 133, all Worthington meters. Although attended with considerable expense, we are satisfied that the expense is more than repaid by the greater amount of water rent thus obtained, while, at the same time, their use is satisfactory to almost all large consumers, who are willing to pay for the amount of water taken by them, when it is ascertained by actual measurement.

COST OF THE WATER WORKS.

The Water Works, not including the Tunnel under the Lake, have cost, to March 31st, 1865, \$1,381,735.27	
Lake Tunnel expenditures to same date,-----	109,308.86
	<hr/>
	\$1,491,044.13

Means to pay for the above have been obtained, as stated below:—

Six per cent. Bonds, -	\$1,030,000	
Seven per cent. " -	278,000	\$1,308,000.00
Deduct discount on 6 per cent. Bonds,	57,133.08	
		<hr/>
		\$1,250,866.92
Am't overdrawn from City Treasury,	51,877.85	
Balance obtained from Water Rents,	188,299.36	
		<hr/>
		\$1,491,044.13

ADDITIONS TO THE WORKS DURING THE YEAR.

As already noticed, nearly three hundred thousand dollars have been expended during the last year, on the two feet Wabash Avenue main, on nearly 12 miles of distributing pipes, and on the tunnel in progress under Lake Michigan. As the balance in the Treasurer's hands at the commencement of the year, was but about six thousand dollars, and no more than 175 bonds have been sold during the year, it follows that there have been overdrawn from the City Treasury \$51,877.85, an amount which would have been greater but for the premium obtained on the bonds, and the excess of Water Rents over the interest and expenses for the year.

The Wabash Avenue main is a most important improvement. It extends from Adams Street to Twenty-Second Street, and will probably be connected at some future time with a reservoir in the more Southern part of the South Division. Prior to its being put into use, the supply was wholly insufficient in all that part of the South Division South of Adams Street, and particularly in the more remote parts, as at Camp Douglas, having a population during the year of from 10,000 to 14,000, and at the large packing-houses and other establishments extending along Archer Road to the Rolling Mills. Since the laying of the main, the Board have been gratified to observe a total cessation of the previously existing complaints of an inadequate supply of water.

The Board have laid, during the past year, 11⁴⁵⁷⁷₅₂₈₀ miles of

distributing mains, which were laid in the three divisions, as follows:—

South Division, ----- 19,118 feet.

West Division, ----- 35,268 “

North Division, ----- 8,271 “

Total, ----- 62,657 feet or

11 miles 4577 feet.

The prices of iron, lead, and labor have ruled very high, during the year, as is well known, and as a consequence, these pipes have been put down at an unusually high cost.

In 1861, 13,761 ft. of distributing pipes were laid,

costing, -----				\$12,008.00
In 1862, 50,881 ft.	“	“	“	39,197.00
In 1863, 68,691 ft.	“	“	“	75,241.00
In 1864, 62,657 ft.	“	“	“	104,828.50

The Board have, however, considered the supply of water to the city as one of those necessities which cannot be dispensed with, and it has not seemed to us proper to cease extending the pipes merely on account of the unusual cost of the work. As a rule, the Board have laid pipe only where there would be a sufficient income to pay the interest on its cost when laid; and yet the petitions which the Board had on hand at the close of the fiscal year, and have received since then, are for no less than fifteen miles of pipe, all from streets so far occupied as to pay, as an annual water tax, the minimum rate required by the Board, which, at present prices, amounts to about fifteen cents per running foot. As every day adds to the number of these petitions, your honorable body will see that it will be necessary to lay as large an amount of pipe this year as for several years past, and that it is not practicable to supply immediately all the localities desiring an extension of the pipes. The following tables, showing the total amounts of pipes laid by this City and several other cities, and showing the relations of their incomes to their amounts of pipes, will be found of interest. Our population is spread over a larger territory than is usual

with most cities, and it accordingly takes here a proportionately greater supply of water and gas pipes, and of street and other public improvements to supply a given population.

Amounts of supply and distributing mains in several cities and annual water tax :—

New York,	294 miles	3334 ft.	Ann'l Income,	\$907,234.27
Philadelphia,	363 "	4031 ft.	" "	586,968.71
Brooklyn,	171 "	742 ft.	" "	386,416.08
Boston, ('63)	135 "	2143 ft.	" "	394,506.25
Cincinnati,	93 "	545 ft.	" "	259,286.02
Chicago,	131 "	3495 ft.	" "	224,902.57

The Board, last year, contracted for some 500 tons of pipes, to be delivered on the opening of navigation this year, all of which have since been received and are being laid. Besides this amount, they have lately contracted for 500 tons pipes at prices much below those of last year. All these several lots will lay about $12\frac{1}{2}$ miles of pipe, and will not be sufficient to supply all the localities needing them.

LAKE TUNNEL.

At the time of rendering our last annual report, operations had just commenced at the Lake Tunnel. The work was commenced on the 17th of March previous, and when the report was made, the iron cylinders making the upper part of the land shaft had been sunk through the sand, and the underlying clay through which the tunnel was to be constructed had been reached. As was then hoped, no serious difficulty has arisen in the prosecution of the work on the land shaft and shore end of the tunnel since the clay has been reached. At the close of the fiscal year, the tunnel had been finished from the land shaft out under the lake 2139 feet, and at the date of this report is finished 3023 feet, with a present rate of progress of about 12 feet per day. No work has yet been done on the outer shaft, although the crib making the pier with which the shaft will be surrounded in the lake is built and ready for launching, and the iron cylinders for the shaft are all ready. The Board had

the assurance of the contractors, and it was their expectation, that the crib would be put in place and shaft sunk last fall, and that the work would be prosecuted from the lake shaft shorewards during the winter. The Board were, however, disappointed in their expectations, and on the 22d March addressed a note to the contractors, Messrs. Dull & Gowen, urging a vigorous prosecution of the work on the crib, and requiring them to have it launched ready for towing out to the terminus of the tunnel by the 15th of May. The contractors in their reply promised a compliance with the order of the Board, and were confident that the crib would be afloat at the time set. It is hoped now that it will be launched in a few days. The five moving screws to which the crib is to be fastened when floated out, are in place, having been embedded in the clay at the bottom of the lake. The work on the crib has been most thoroughly done, and Messrs. Dull & Gowen are entitled to much credit for it. The immediate supervision and direction of the construction of the crib was entrusted by the contractors to Mr. Geo. R. Bramhall. The Board desire to express their appreciation of the ability shown by Mr. Bramhall in this work. The City has been exceedingly fortunate in that the building and launching of the crib fell into the hands of so skillful and accomplished a mechanic.

The completion of the tunnel will necessarily be delayed much beyond the time required by the contract, but if the crib is successfully set without much further delay, it is believed that the tunnel will be finished by the close of next year.*

NEW ENGINE AND ENGINE HOUSE.

In our last report it was remarked that the consumption of water in the city was rapidly increasing, and approximating towards the amount which the present engines could be safely relied on to supply, and that it would be necessary soon to procure another engine.

* Since going to press, the crib has been successfully launched and sunk in the lake, at the place marked for the outer shaft, two miles from the lake shore

The subject has been under examination throughout the year. The Board have visited a number of Water Works having pumping machinery, and have caused their Engineer at the pumping works, Mr. Cregier, to visit all the principal Water Works of the country making use of engines. Having sought all the information to be obtained from other works, plans and specifications have been prepared for an engine of a capacity sufficient to pump 18,000,000 gallons of water in 24 hours, under a head of 125 feet, with a pressure of steam on the boiler of 25 lbs. to the inch. The Board recommend that this engine be put up as soon as practicable. The erection of this engine, however, involves a large outlay. The engine itself will cost as much as one hundred thousand dollars, and a very large expenditure will be needed to prepare a pumping well and suitable foundations for it. Where the engine shall be located has been a question of much discussion. If placed in connection with the present engine house, it is feared that the excavations for the new pump well and foundations will disturb the foundation of the present building with its machinery, and interrupt the working of the engines and the supply of water to the city. The injury which would result from the interruption of the supply of water would be so serious, that it has seemed to the Board, that any location for the proposed engine which would endanger the present supply, was out of the question. The Board have, therefore, finally concluded to put in a pump well with foundations wholly separate from the present building and removed from it, and large enough for all the engines which will be likely to be needed for many years. The cost, of course, will be large, amounting for the building complete with its connections to as much as for the engine itself.

SEWERAGE WORKS.

The sewers of the city have been maintained throughout the year, in a good state of repair and efficiency. New sewers were constructed during the year, as follows, viz.:

SEWERS CONTRACTED TO BE LAID IN 1863, BUT FINISHED IN 1864.

South Division,	8,519 feet, costing,	-----	\$27,379.69
West “	1,424 “ “	-----	2,973.62
North “	1,293 “ “	-----	2,010.37

SEWERS CONTRACTED FOR IN 1864, AND LAID DURING THE SAME YEAR.

South Division,	2,393 feet, costing,	-----	\$12,816.49
West “	6,346 “ “	-----	24,105.98
North “	5,046 “ “	-----	17,935.33

Total,-----25,021 ft. or about $4\frac{3}{4}$ miles,
costing,-----\$87,221.48

In the accompanying report of the City Engineer, will be found a detailed statement showing the amounts of each of the various sizes of sewers laid in this city, and showing the total length of all the public sewers laid and in use in the city, at the close of the fiscal year, to be $69\frac{2394}{5280}$ miles.

The repairs for last year, cost	-----	\$4,597.63
The cleansing of the sewers, “	-----	9,417.81

INTEREST AND EXPENSES FOR THE YEAR.

Interest on sewerage Loan Bonds,	-----	\$74,156.85
Sinking Fund, am't set aside of tax 1863, -----		17,398.75
Salaries and Miscellaneous expenses, -----		9,780.46
Repairs and cleaning as above, -----		14,015.44

\$115,351.50

SEWERAGE LOAN BONDS.

Six per cent bonds outstanding April 1, '65,---	\$87,000.00
Seven " " " " " "	1,000,000.00

Total am't of sewerage bonds outstanding, \$1,087,000.00

We invite your perusal of the interesting report of sewers, by Mr. Clarke, the principal assistant-engineer, and included in the report of the city engineer.

SEWERAGE SINKING FUND.

By the charter the Board are limited to the bonds of the City of Chicago for investment, and to the present time the proceeds of the Sinking Fund, except the small amount due upon the old mortgages obtained from the former sewerage board, have been wholly applied to the purchase of sewerage bonds.

Balance in hands of City Treasurer, April 1, '65,	\$271.55
Due from the sewerage tax of 1864,-----	18,439.57
Mortgages now due,-----	5,867.10

Amount of Sinking Fund not yet applied to the
purchase of Sewerage bonds.-----\$24,578.22

There have been purchased to the present time, and canceled of sewerage bonds \$100,000, of which amount \$42,000 were canceled during the fiscal year just closed.

CLEANSING CHICAGO RIVER.

The state of the river has been substantially as it has been for the last few years; but rather better than worse. It has been a most important year, however, in this respect, that measures have been agreed upon and set in motion, which it is hoped will finally effectually remove all offensiveness from the main river and south branch. By the amendments to the charter last winter, two new members were added to the Board, and empowered to act with the other members, but only on matters pertaining to the cleansing of the Chicago River. The full Board for objects pertaining to the cleansing of the river, consists therefore of five members, the two new members being Messrs. Roswell B. Mason and William Gooding. The charter amendments also authorized a loan of two millions of dollars for these purposes, under the same provisions as the Sewerage Loan, as regards a sinking fund and otherwise.

During the discussions which were held last winter, as to the legislation necessary to best provide for efficiently remedying the condition of the river, and agreeably to a recommendation from a joint committee from the Common Council and the Board of Trade of this City, a commission was appointed by the Council consisting of the Mayor, Hon. F. C. Sherman, and five engineers, Messrs. William Gooding, R. B. Mason, John Van Nortwick, E. B. Talcott, and E. S. Chesbrough. The report of this commission is of so much interest and importance that to preserve it in a permanent form we have appended it to this report.

The project which this commission recommended was, that the Illinois and Michigan Canal, between Chicago and a point about three miles this side of Lockport, be deepened so that the water of Lake Michigan will flow continually through the Canal to the Illinois River. The surface of the Canal, as is generally

known, is now about eight feet above the level of the lake. The original plan for the Canal, was that it should be made in the same way as proposed by the commission, and much of the work was done on this deep cut plan, all of which will lessen the amount of work to be done now. Immediately after the organization of the Board in the present state, this same plan was adopted by us, and recommended to your honorable body. Having obtained from you the requisite authority, surveys were immediately instituted to secure the best line, and determine the quantities of the earth and rock cuttings to be done, and as speedily as practicable, it is proposed to proceed with the execution of the work. We regard the deepening of the canal as an incipient step to that larger undertaking, the enlarged and deepened Ship Canal, the construction of which we believe, will add to the commerce and business of this city to an extent which cannot now be estimated.

A most important law was passed by the State Assembly, authorizing the city to cut down this summit division of the canal, as it is called, and for the moneys so expended, creating a lien upon the canal and its revenues after the payment of the present canal debt. It is thought by those most conversant with the business of the canal, that under that lien the city will have refunded to it all the money which will be spent on this improvement. We have appended a copy of the law to this report.

CHICAGO HARBOR.

The works undertaken during the year for the preservation of the harbor have been very extensive. It is believed that their construction will relieve the city from any very large expenditures for several years to come.

During the year the dredging for the preservation of the direct channel through the bar has been continued when the state of the lake has permitted it, and there is now a commodious and easy entrance to the harbor, with a depth of water of 14 feet with the lake at its ordinary height, or of 12 feet at standard low water.

The most important work, however, accomplished during the year, has been the extension outwards into the lake of the north pier some four hundred feet. It had for a considerable time been evident to the Board that the most thorough measures were necessary for the preservation of the harbor, and we early last year directed the city engineer to gather all information accessible to him, relating to harbor preserving works, and as speedily as practicable to mature a plan for the preservation of the channel through the bar. In July last, having previously decided to extend the pier, the project of the Board was laid before you, and speedy action was requested on it. The recommendation of the Board was promptly adopted, and the Council in August authorised the work and appropriated the sum of seventy-five thousand dollars for its cost. The weather afterwards, however, offered very few favorable opportunities for the working of a dredge in the lake in preparing for the sinking of the cribs, and but about eighty feet were got in last fall. During the present season, the work has been prosecuted with more success, and the cribs have been sunk for the whole length of the proposed pier extension, four hundred feet, thus sheltering, and it is hoped securing, the newly dredged out channel through the bar.

A small sketch is given herewith, showing the pier as extended, the bar in its present state, and the new and old channels for entering the harbor.

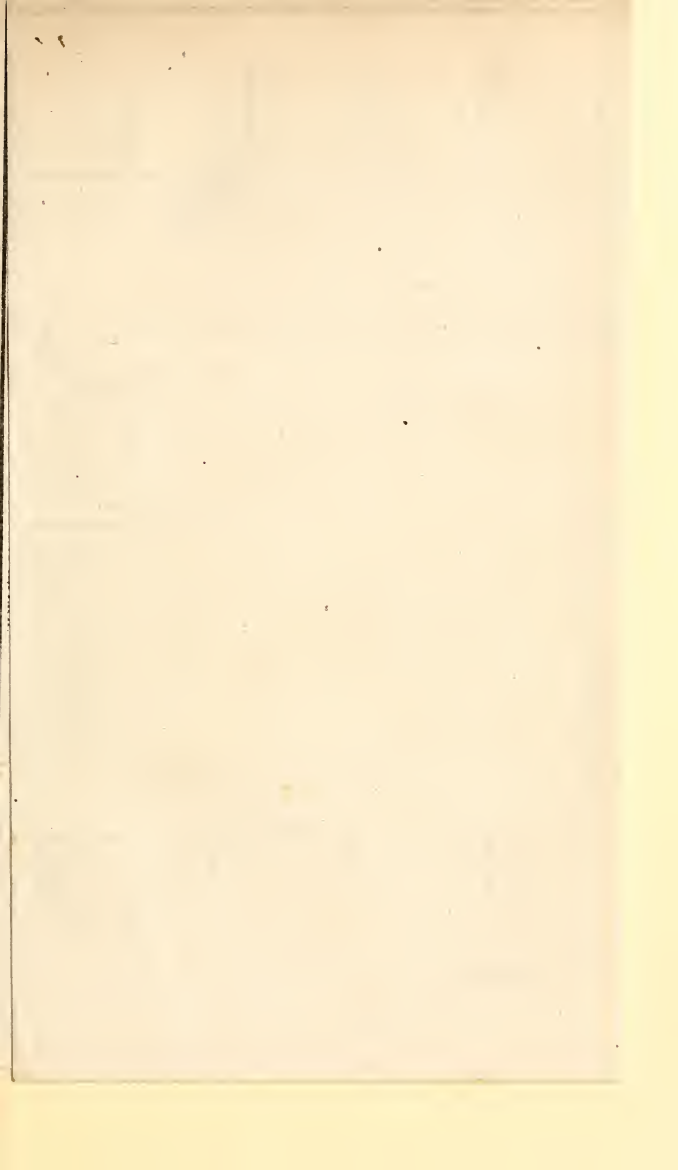
All of the work has been done with the sanction of the U.S. War Department, and under the general direction of one of its officers. It would seem that the work should have been wholly done, and paid for by the United States, and it is to be hoped that the outlay which has now been made by the city, may be hereafter refunded to it.

Embraced in the report of the city engineer is a most interesting report from Col. T. J. Cram, charged by the War Department with the care of the lake harbors, in which he discusses at length the manner of formation of the bar across the mouth of the harbor, and the growth into the lake of the shore to the north of the pier, and indicates a probable limit when the extension of the shore into the lake and the growth of the bar will be arrested, and the mouth of the harbor acquire something of permanency in its character and shape. The discussion of the subject by him, upon facts derived from observation, shows a careful study of the causes producing the changes, which from the earliest observation of our oldest citizens have been in constant progress at the mouth of the harbor, and will be particularly interesting to the quite large number of them who have made these changes and the means of securing the harbor against their effects a matter of careful consideration.

For many years the height of the lake has been daily gauged, under the Sewerage Department, and a tabular statement of its various heights through a term of years commencing with 1855, is given in the report of Mr. Clarke, on sewerage, already referred to.

The table is interesting and valuable. We give below a statement of the highest, lowest, and average levels attained by the lake during this series of years:—

The levels are so many feet above or below standard low water.



A small sketch is given herewith, showing the pier as extended, the bar in its present state, and the new and old channels for entering the harbor.

All of the work has been done with the sanction of the U.S. War Department, and under the general direction of one of its officers. It would seem that the work should have been wholly done, and paid for by the United States, and it is to be hoped that the outlay which has now been made by the city, may be hereafter refunded to it.

Embraced in the report of the city engineer is a most interesting report from Col. T. J. Cram, charged by the War Department with the care of the lake harbors, in which he discusses at length the manner of formation of the bar across the mouth of the harbor, and the growth into the lake of the shore to the north of the pier, and indicates a probable limit when the extension of the shore into the lake and the growth of the bar will be arrested, and the mouth of the harbor acquire something of permanency in its character and shape. The discussion of the subject by him, upon facts derived from observation, shows a careful study of the causes producing the changes, which from the earliest observation of our oldest citizens have been in constant progress at the mouth of the harbor, and will be particularly interesting to the quite large number of them who have made these changes and the means of securing the harbor against their effects a matter of careful consideration.

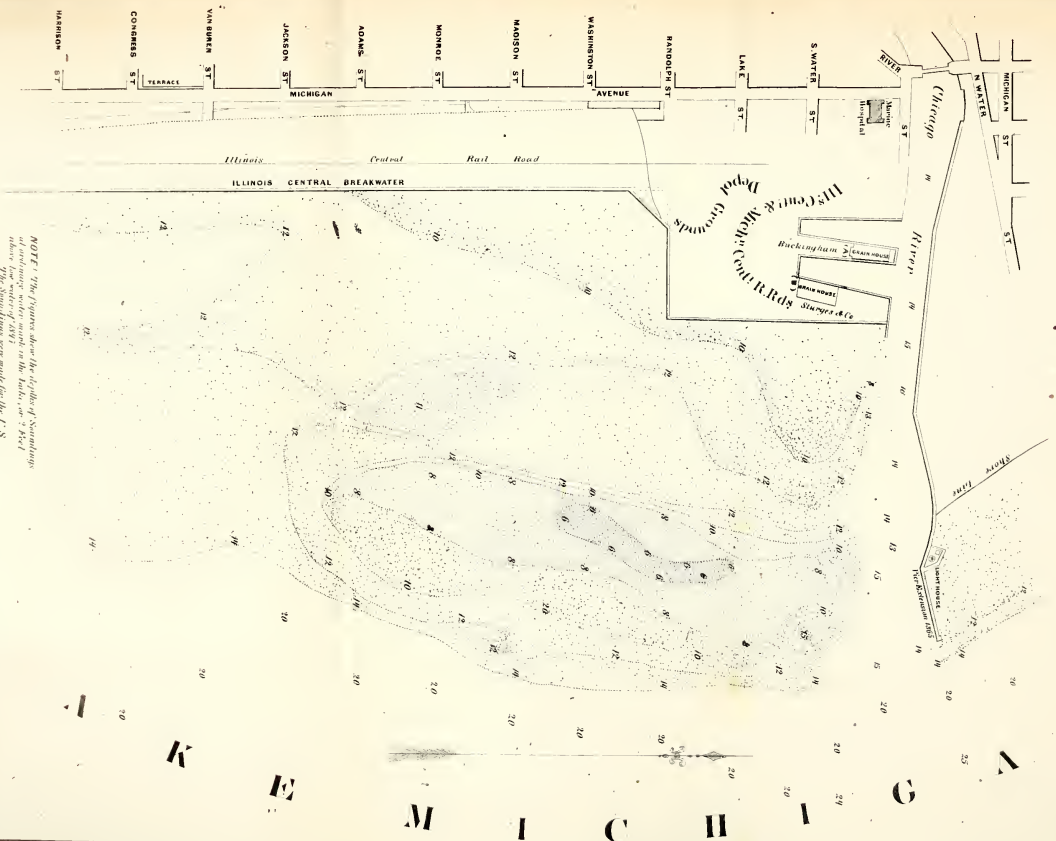
For many years the height of the lake has been daily gauged, under the Sewerage Department, and a tabular statement of its various heights through a term of years commencing with 1855, is given in the report of Mr. Clarke, on sewerage, already referred to.

The table is interesting and valuable. We give below a statement of the highest, lowest, and average levels attained by the lake during this series of years:—

The levels are so many feet above or below standard low water.

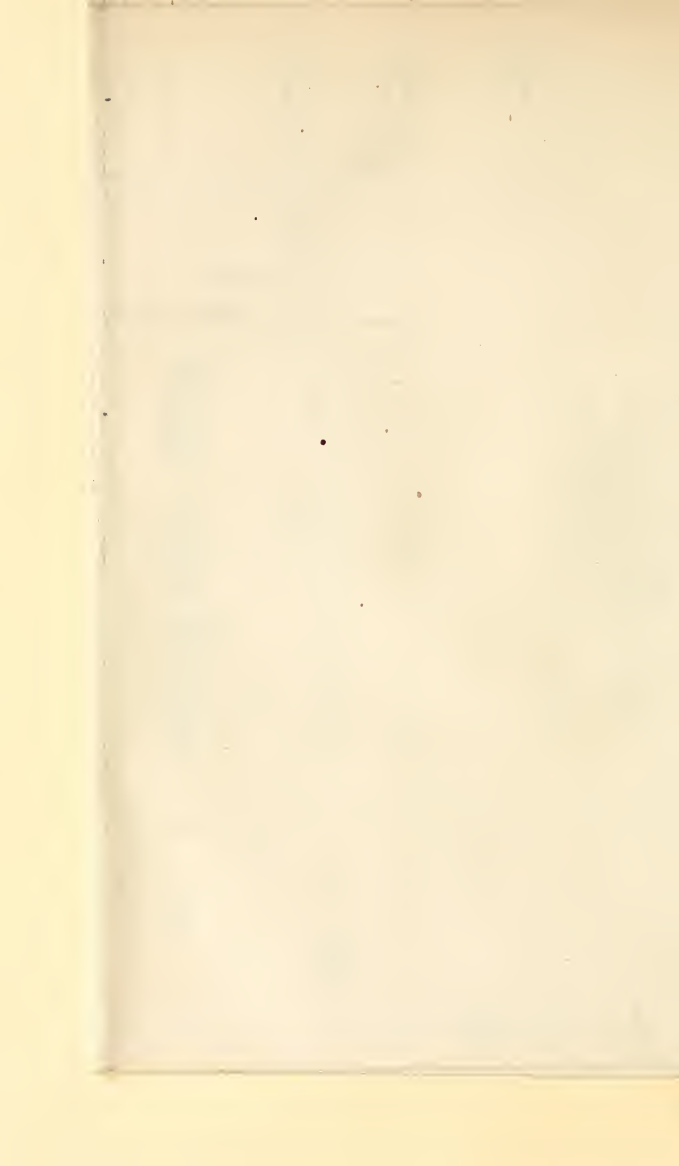
Chicago Harbor

August 1865.



NOTE 1. The figures show the depths of Soundings of ordinary water mark in the tanks, or 2 feet above low water of Ashy.

THE UNIVERSITY OF CHICAGO



Years.	Highest level reached by the Lake during the year.	Lowest level to which the Lake fell during the year.	Average level of the Lake during the year.
1855, -----	3.45	0.15	1.56
1856, -----	3.05	0.42	1.60
1857, -----	4.35	0.60	2.42
1858, -----	4.69	1.33	2.90
1859, -----	4.45	1.31	2.98
1860, -----	3.53	1.30	2.54
1861, -----	4.40	0.90	2.56
1862, -----	3.30	1.20	2.50
1863, -----	3.30	0.70	2.10
1864, -----	2.80	-0.80	1.57

It will be observed that the lake was, during this period, when at its greatest height, 5.49 feet higher than when at its lowest level. The greatest fluctuation in one year was 3.75 feet.

STREET WORK.

The decision of the court, that the provisions of the charter of 1863, under which the improvements of the streets and alleys were made, were in conflict with the state constitution, left the city last year without any law by which such improvements could be carried on. Accordingly, it was necessary to let a large amount of street work lie over to this year, which ought to have been done last year. The special assessments for this year will, in consequence, be unusually heavy. A large number of most important street improvements have already been recommended to you and approved by you, and it is hoped that during the coming year the condition of several of the most important thoroughfares will be materially bettered.

The city, by its expenditures from the general fund, does not, however, at all keep pace with what is being done by special assessment. The appropriations for street repairs and cleaning are altogether too limited. In 1857 and 1858, about as much money was spent for these purposes as now, and as prices then were only half what they are now, and the city was only about half as large, it follows that about three or four times as much in proportion was appropriated then as now. The Council has, for instance, appropriated this year, for the South Division, \$24,000. This sum of money is expected to keep clean all the improved streets and alleys of the South Division, and to do more or less repairing on them; to build, and keep in repair, all the culverts, aprons, and crosswalks of more than one hundred miles of its streets and alleys; to keep the earthen streets thrown up in shape and their ditches in order; and, finally, to pay the expenses for inspecting the sidewalks, and for enforcing the orders of the Board, requiring owners to build or repair their sidewalks.

On one-third or one-fourth of a mile of a street paved by special assessment, property owners are required to pay more than the annual appropriation made by the city for the repairs and cleaning of the streets and alleys, and for the culverts, aprons, street-crossings, and sidewalks of the whole South Division.

While the Board, however, are of the opinion that a larger amount of money could be wisely spent for keeping the streets and alleys of the city in order, it seems to us that many of the complaints in regard to their condition are quite unreasonable. They do not take into account the many difficulties, peculiar to Chicago, in the way of their immediate improvement. The city is comparatively new, and although it may do much more than is usual with other and older cities of its size and resources, it will still take a long time before all the streets and alleys can be improved. The site of the city is low and nearly level, and almost without natural drainage. Its streets are in the main formed of the natural soil, generally of clay, or clay mixed with vegetable mould, and most of the streets must be in this state for years to come. In wet weather, especially in the spring and fall, when there is unavoidably a great deal of standing water, such streets being continually worked over and ploughed up by teams become exceedingly muddy and miry—nor can they be otherwise, at such times, until they are filled up and protected with some sort of a pavement, or other firm covering. The work of paving or otherwise improving them, is being gradually extended, taking first in order the business streets and alleys, and the various avenues connecting the city and country, and is progressing probably more rapidly than is desired by the property owners who have to pay for most of the the improvements. Still this is a work of time and much cost; and it is not reasonable to suppose that the city can at once get its thoroughfares into as good a state as the streets of older places, with good natural drainage, with gravelly or rocky soils, and which have attained their present state of improvement through a long period of time.

As the streets of the city are generally as remarked above, without being paved or otherwise protected, it is of course more difficult to keep clean those streets which are improved. The mud is being continually deposited on them from the adjacent or intersecting unimproved streets and alleys, and the labor of keeping the former clean is largely on account of their proximity to such unimproved streets.

By improving all the streets and alleys of certain limited districts, including the business parts of the South, West, and North Divisions, as the Board aim to do, it is hoped that this evil will be in part remedied; and that where the travel and transportation are heaviest, and good streets are most needed, they will soon be had.

It is proper for the Board, at this time, to call attention to the kind of laborers in general use on street work, and which makes such work more expensive than that of other departments, as the water and sewerage. It has always been the practice to afford employment on the streets, as far as practicable, to old and comparatively feeble men, the present price paid being one dollar and fifty cents per day. Such labor is, of course, unprofitable, and the burden of it all falls on the street work. The system was not, however, established by the Board, and we have not felt that it was the wish of the Council or the citizens that it should be changed.

It is quite likely that more or less of the work of cleaning and repairing the streets could be better done by contract than by day labor. The Board are quite willing to try this method wherever it shall be practicable, and promise better results than the present system of doing the work by laborers in the employment of the city.

The Board desire to do all that is possible with the limited appropriations made, but they are wholly inadequate to maintaining the streets of the city in tolerable order.

OPENING AND EXTENDING STREETS AND ALLEYS.

The following streets and alleys were ordered opened, widened, or extended by the Council, during the year:—

Division St. Extended and widened from Clark St. to Lake Michigan, so that the street shall be the full width of sixty-six feet.

Fourteenth St. Extended from State st. to Indiana Ave.

Lumber St. Extended from Union St. to Halsted St.

North Clark St. Straightened from North Avenue to Fullerton Avenue.

Twentieth St. Extended east from State St. to lands of Ill. Cent. R. R.

Alley. Opened through block 2, Clark's Add., and block 3, S.W. $\frac{1}{4}$, Sec. 22, 39, 14.

Alley. Opened in block 6, Assessors' Div., Sec. 22, 39, 14.

"	"	"	7,	"	"	"
"	"	"	8,	"	"	"
"	"	"	9,	"	"	"
"	"	"	13,	"	"	"
"	"	"	14,	"	"	"
"	"	"	15,	"	"	"
"	"	"	16,	"	"	"

SIDEWALKS.

The following statements show the work done on sidewalks, ordered by the Council, during the year. As much, or more, is, however, done under the orders of the Board to have walks relaid.

SIDEWALKS ORDERED BY THE COUNCIL DURING THE YEAR.

SOUTH DIVISION.

S. side	25th st. bet. Cottage Grove av. and Indiana av.	Laid.
S. side	Archer rd. bet. Halsted st. and Lime st.	Laid.
S. side	26th st. bet. Cottage Grove av. and Indiana av.	Partly laid.
N. side	Alley in block 119 School sec. add. to Chicago.	Not necessary.
W. side	Burnside st. from 16th st. north to terminus.	Partly laid.
N. side	21st st. bet. State st. and Indiana av.	Laid.
E. side	Michigan av. from River st. 40 ft. south thereof.	Laid.
S. side	River st. bet. Michigan av. and alley next east.	Laid.
S. side	22d st. bet. State st. and Buddan st.	Laid.
N. side	21st st. bet. State st. and Archer road.	Laid.
B. sides	Elgin st. bet. Purple st. and Stewart av.	Partly laid.
N. side	15th st. bet. State st. and Burnside st.	Laid.
E. side	Prairie av. bet. 26th st. and 29th st.	Laid.
S. side	14th st. bet. State st. Michigan av.	Laid.
E. side	S. Clark st. bet. 18th st. and 22d st.	Partly laid.
E. side	Kankakee av. bet. 26th st. and 29th st.	Partly laid.

WEST DIVISION.

N. side	18th st. bet. Canal street and Halsted st.	Not laid.
N. side	Bunker st. bet. Canal st. and Clinton st.	Laid.
W. side	Ruble st. bet. 16th st. and 18th st.	Partly laid.
S. side	Bunker st. bet. Jefferson st. and Desplaines st.	Partly laid.
S. side	DeKoven st. bet. Jefferson st. and Halsted st.	Laid.
S. side	Forquer st. bet. Jefferson st. and Halsted st.	Laid.
N. side	12th st. bet. Jefferson st. and Desplaines st.	Laid.
W. side	Desplaines st. bet. Taylor st. and DeKoven st.	Partly laid.
S. side	Catharine st. bet. Stewart av. and Jefferson st.	Partly laid.
E. side	Union st. bet. Maxwell st. and O'Brien st.	Not laid.
S. side	Liberty st. bet. Canal st. and Stewart av.	Partly laid.
S. side	Irwin st. bet. Canal st. and Arthur st.	Partly laid.
N. side	18th st. bet. Canal st. and Chicago river.	Laid.
W. side	Aberdeen st. bet. Polk st. and Harrison st.	Laid.
W. side	Blue Island av. bet. Henry st. and 16th st.	Laid.

WEST DIVISION, continued.

W. side	Morgan st. bet. Randolph st. and Jackson st.	Laid ex. 120 ft.
E. side	Loomis st. bet. Van Buren st. and Harrison st.	Nearly all laid.
B. sides	Throop st. between 12th st. and Mitchell st.	Laid.
S. side	Better st. bet. May st. and Sholto st.	Reconsidered & ref'd.
N. side	Front st. bet. Carpenter st. and 5th st.	Partly laid.
N. side	Milwaukee av. bet. Elston rd. and Rucker st.	Laid.
N. side	Warren st. bet. Hoyne st. and Leavitt st.	Not laid.
B. sides	Washington st. bet. Lincoln st. and Robey st.	Laid ex. 25 ft.
E. side	St. John's Place bet. Carrol st. and Depot place.	Not laid.
E. side	Rose st. between Chicago av. and Cornell st.	Not laid.
S. side	Fry st. bet. Rose st. and Holt st.	Laid.
S. side	Chicago av. bet. Paulina st. and Hoyne st.	Partly laid.
E. side	N. Ada st. bet. Randolph st. and Lake st.	Partly laid.
N. side	Hubbard st. bet. Robey st. and Leavitt st.	Not laid.
S. side	Indiana st. bet. Paulina st. and Wood st.	Not laid.
N. side	Washington st. bet. Hoyne st. and Oakley st.	Partly laid.

NORTH DIVISION.

W. side	Kingsbury st. bet. Kinzie st. and Chicago av.	Laid.
N. side	Superior st. bet. Market st. and Kingsbury st.	Laid ex. 75 ft.
S. side	Oak st. bet. Green Bay st. and Lake Michigan.	Laid.
E. side	Franklin st. bet. Kinzie st. and Chicago av.	Partly laid.
N. side	Huron st. bet. Clark st. and Dearborn st.	Laid.
S. side	Huron st. bet. Wells st. and Franklin st.	Laid.
N. side	Elm st. bet. Wolcott and Lake Michigan.	Laid ex. 250 ft. repo'd
S. side	Illinois st. bet. Wells st. and Franklin st.	Laid. [not necessary.
B. sides	Sedgwick st. bet. Huron st. and Chicago av.	In progress.
S. side	E. White st. bet. Dearborn st. and Wolcott st.	Laid.
B. sides	Schiller st. bet. Wells st. and Clark st.	Partly laid.
N. side	Belden st. bet. Green Bay st. and Little Fort rd.	Laid.
B. sides	Linden st. bet. Wells st. and Sedgwick st.	Street not opened.
B. sides	Twomey st. from Sedgwick st. to W. terminus.	Laid.
B. sides	Schiller st. bet. Clark st. and Lake Michigan.	Partly laid.
W. side	Clark st. from Asylum st. to Wells st. and W. side Wells st. N. to where walk is laid.	Not laid.
N. side	Wisconsin st. bet. Clark st. and Larrabee st.	Partly laid.
E. side	Little Fort rd. from its junction with Wells st. to Asylum place.	Partly laid.
B. sides	Menominee st. bet. Wells st. and Sedgwick st.	Partly laid.
S. side	Black Hawk st. bet. Larrabee st. and Mohawk st.	Laid.
N. side	North av. bet. Sheffield av. and N. av. bridge.	Partly laid.
S. side	Carl st. bet. Wells st. and Lasalle st.	Laid.

THE FOLLOWING WILL SHOW THE PRESENT CONDITION OF
SIDEWALKS REPORTED IN LAST YEAR'S REPORT AS NOT
LAID OR INCOMPLETE:—

SOUTH DIVISION.

E. side	Indiana av. bet. 22d st. and Ridgely place.	Partly laid.
W. side	Dearborn st. bet. Archer rd. and 22d st.	Laid.
E. side	Michigan av. bet. 12th st. and 23d st.	Laid.
W. side	Cottage Grove av. bet. Ridgely and Douglas pl.	Laid.
N. side	Douglas pl. bet. Cottage Grove av. and the Lake.	Partly laid.
B. sides	Indiana av. bet. 14th st. and 22d st.	Laid.
N. side	Douglas pl. bet. Cottage Grove and Kankakee av.	Laid.
E. side	Wabash av. bet. 22d and 24th st.	Laid.
W. side	Prairie av. bet. Cottage Grove av. and 29th st.	Partly laid.
S. side	22d st. bet. Archer rd. and Grove st.	Laid.
W. side	Wentworth av. bet. 17th st. and 18th st.	Laid.
S. side	17th st. bet. Wentworth av. and Clark st.	Laid.
N. side	Archer rd. bet. Lock st. and Reuben st.	Laid.
E. side	Deering st. bet. Archer rd. and Cologne st.	Laid.
W. side	Main st. bet. Archer rd. and Cologne st.	Laid.
S. side	Hickory st. bet. Mary st. and Lock st.	Not laid.
W. side	Deering st. bet. Archer rd. and Lyman st.	Laid.
N. side	Fuller st. bet. Archer rd. and Cologne st.	Laid.
W. side	Bonfield st. bet. Archer rd. and Hickory st.	Laid.
S. side	19th st. bet. Clark st. and State st.	Laid.
E. side	Joseph st. bet. Archer rd. and Hickory st.	Laid.
S. side	Cologne st. bet. Main st. and Deering st.	Laid.
N. side	Hickory st. bet. Mary st. and Deering st.	Laid.
W. side	Buddan st. bet. Archer rd. and Alexander st.	Laid.
E. side	Wentworth av. bet. 21st st. and 22d st.	Laid ex. 100 ft.

WEST DIVISION.

S. side	Washington st. bet. Robey st. and Hoyne st.	Laid.
B. sides	Park av. bet. Robey st. and Hoyne st.	Laid ex. 3 lots.
W. side	Hoyne st. bet. Madison st. and Van Buren st.	Laid.
B. sides	String st. from Canal Port av. South.	Not laid.
E. side	Jefferson st. bet. Judd st. and Meagher st.	Laid.
B. sides	Barber st. bet. Union st. and Halsted st.	Laid.
W. side	Ann st. bet. Lake st. and Kinzie st.	Partly laid.
E. side	Loomis st. bet. Van Buren st. and 12th st.	Partly laid.
N. side	Monroe st. bet. Morgan st. and Rucker st.	Laid.
W. side	Ridgeville rd. bet. Milwaukee av. and North av.	Not laid.
E. side	Jefferson st. bet. Mitchell st. and 22d st.	Partly laid.
W. side	Laffin st. bet. Van Buren st. and Taylor st.	Laid.
W. side	Noble st. bet. Milwaukee av. and Division st.	Not laid.
W. side	Ada st. bet. Lake st. and Randolph st.	Partly laid.
N. side	Rebecca st. bet. B. I. av. and Rucker st.	Laid.
N. side	North av. bet. Elston rd. and the bridge.	Partly laid.
W. side	Leavitt st. bet. Lake st. and Kinzie st.	Laid ex. 1 lot.
N. side	Washington st. bet. Oakley st. and Western av.	Not laid.
B. sides	Ewing st. bet. Canal st. and Beach st.	Laid.
B. sides	Evans st. bet. Union st. and Halsted st.	Not laid.
N. side	Van Buren st. bet. Sangamon and Aberdeen st.	Laid.

WEST DIVISION, continued.

W. side	Carpenter st. bet. Fulton st. and Kinzie st.	Partly laid.
S. side	Catharine st. bet. B. I. av. and Morgan st.	Partly laid.
N. side	Van Buren st. bet. Throop st. and Loomis st.	Partly laid.
N. side	Jackson st. bet. Rucker st. and Loomis st.	Laid.
E. side	Throop st. bet. Jackson st. and Monroe st.	Laid bet. Monroe and
E. side	Peoria st. bet. Randolph st. and Washington st.	Laid. [Adams st.
B. sides	Kramer st. bet. Union st. and Halsted st.	Laid.
W. side	Holt st. bet. Chicago av. and Cornell st.	Laid.
B. sides	Catherine st. bet. Canal st. and Jefferson st.	Partly laid.
N. side	Jackson st. bet. Robey st. and Hoyne st.	Laid.
N.E. side	Milwaukee av. bet. Reuben st. and Wood st.	In progress.
W. side	Halsted st. bet. Milwaukee av. and 4th st.	Laid.
S. side	Pratt st. bet. Milwaukee av. and Sangamon st.	Partly laid.
N. side	Liberty st. bet. Canal st. and Jefferson st.	Laid ex. 100 ft.
B. sides	Barber st. bet. Jefferson st. and Union st.	Laid ex. 25 ft.
B. sides	Canal st. bet. Van Buren st. and W. 16th st.	Laid ex. 150 ft.
E. side	Hoyne st. bet. Walnut st. and Lake st.	Not laid.
W. side	Aberdeen st. bet. Taylor st. and 11th st.	Laid.
W. side	Halsted st. bet. 22d st. and the bridge.	Laid.
B. sides	Park av. bet. Lincoln st. and Robey st.	Partly laid.
S. side	Fulton st. bet. Green st. and Elizabeth st.	Partly laid.
S. side	16th st. bet. Halsted st. and Rucker st.	Partly laid.
E. side	Elston rd. bet. Milwaukee R. R. Crossing and North av.	Not laid.
		Suit pending.

NORTH DIVISION.

B. sides	Whitney st. bet. Green Bay st. and Dearborn st.	Laid ex. block 12.
S. side	Goethe st. bet. Clark st. and Wells st.	Laid.
B. sides	Vine st. bet. Division st. and Vedder st.	Laid.
S. side	Oak st. bet. Clark st. and Wolcott st.	Not laid.
E. side	Otis st. bet. Division st. and Vedder st.	Laid.
B. sides	Grace st. bet. Division st. and Vedder st.	Laid.
S. side	Granger st. bet. Wells st. and Sedgwick st.	Laid.
B. sides	Lasalle st. bet. Division st. and North av.	In progress.

BRIDGES.

At the time of rendering our last report, we had just contracted for a new bridge at Randolph Street, with Mr. L. Boomer. In July succeeding, the new bridge was finished and in use.

The most important construction, in this department, accomplished during the year, was the building of State Street Bridge. At the beginning of the year, the city was without the right of way to the river on the North side, the land belonging to the G. & C. U. R. R. Co. On the 30th of May, 1864, the Board executed a contract with that Company, by which the right of way was ceded to the city, the Council confirming the contract soon after. The construction of the bridge was entered upon as speedily as practicable, but it was not until the 11th of Jan. last, that the bridge was accepted at the hands of the contractors. Since then, the approaches have been built, and the bridge thrown open to public use. It passes over the railroad tracks in North Water Street at a height sufficiently great to permit the passage of locomotives and cars beneath, and is altogether the most commodious and convenient bridge connecting the North and South Divisions.

The bridge across the North Branch at North Avenue, and that across the South Branch at Fuller Street, failed at the close of the winter, and on the 18th of March last, the Board contracted with Newton Chapin to rebuild the first for \$3700, and the latter for \$6300.

The recent charter amendment, placing the appointment of the bridge tenders with this Board as formerly, seems to us a judicious provision. As the Board are responsible for the bridges, it would seem proper that we should have control over the persons tending them. Our only desire, so far as the making of these appointments is concerned, is to put into office faithful and efficient men,—those who will be the best men for their places.

WASHINGTON ST. TUNNEL.

The annoyances and losses caused by the many interruptions and delays in getting across the river by the bridges, have for a long time led many to look for some more certain means of passage and particularly by tunnel under the river. The necessity has grown more and more apparent as the business of the city has increased, until there seems now a very general demand that there shall be at least two tunnels built, connecting the South Division respectively with the West and North Divisions. The Board have already recommended the project to you, and in response to various ordinances and resolutions of your honorable body, have prepared plans and specifications, and invited bids for one of these tunnels, that crossing under the South branch at Washington Street. The Board now only await your action correcting defects in existing ordinances relative to this tunnel, before proceeding with its construction. It is hoped that decided progress may be made on it during the present year. The tunnel connecting the South and North Divisions should follow as speedily as practicable.

PUBLIC BUILDINGS.

The Island Queen engine house, on West Lake St., in progress at the time of rendering the last annual report, was finished and occupied during the ensuing summer.

The new engine house on Maxwell St., was completed last fall, and turned over to the fire department for use.

For years it has been a great reproach to our City that there was no suitable building for the reception of patients affected with the small-pox. The Board have the gratification of reporting that this want is now wholly supplied by the convenient and commodious hospital erected under our supervision, on the lake shore, and on the grounds of the Chicago cemetery. It has been turned over to the health department, and is now in its charge.

During the year the North market has been raised, the cellar drained and flagged, and the grounds around the building raised to grade and planked. The market is greatly improved by this work.

PUBLIC PARKS AND CEMETERY.

The limited appropriation placed at the disposal of the Board for the benefit of the cemetery grounds, and the various public squares and parks of the city, have been barely sufficient to maintain their fences and sidewalks, and to keep the grounds in tolerable condition.

FIRE ALARM, POLICE, AND WATER TELEGRAPH.

During the year, a most important work has been consummated in the construction of the fire alarm, police, and water telegraph of Messrs. J. F. Kennard & Co. The work has been completed, and the fire alarm and police telegraph turned over to the Board of Police Commissioners. The telegraph connecting the engine houses, reservoirs, and office of the Board needs yet some work to perfect its operations.

LAMP POSTS.

We give below a list of all the various orders of the Council during the year, directing the erection of lamp posts in streets, and showing the progress made in carrying out these orders. The same is also shown as to the Council orders of previous years, for which posts had not been put up at the commencement of last year.

ORDERED BY COMMON COUNCIL DURING THE PAST YEAR.

SOUTH DIVISION.

WHERE ERECTED.	No. Posts	REMARKS.
River st., South Water st. to Rush Street bridge, Kankakee av. near 24th st., and on 24th st. from said avenue to Cottage Grove av.	3	Lamps erected.
16th st., from Indiana av. to Prairie av.	6	Lamps erected.
Calumet av., from 21st st. to 22d st.	3	Assessment made.
Prairie av., from 22d st. to 250 ft. North.	3	" "
	2	Lamps erected.

WEST DIVISION.

WHERE ERECTED.	No. Posts	REMARKS.
South-east cor. Carpenter and Fulton st.	1	Lamp erected.
Washington st., from Jefferson st. to Clinton st.	2	One lamp erected.
Jackson st., from Jefferson st. to Desplanes st.	2	Assessment made.
Aberdeen st., from Adams st. to Jackson st.	5	No pipe yet laid.
Monroe st., from Morgan st. to Aberdeen st.	6	One lamp erected.
Clinton st., from Jackson st. to Van Buren st.	5	Lamps erected.
Green st., from Randolph st. to Lake st.	2	" "
Wood st., from Washington st. to Warren st.	1	" "
Rucker st., from Mitchell st. to 22d st.	32	" "
Rucker st., from Madison st. to Monroe st.	3	" "

THE FOLLOWING LIST WAS REPORTED LAST YEAR AS
INCOMPLETE OR NOTHING DONE:—

SOUTH DIVISION.

WHERE ERECTED.	No. Posts	REMARKS.
Harmon court, State st. to Michigan av.	2	Completed.
Clark st., from 12th st. to 18th st.	26	No pipe laid.
Jackson st., Clark st. to Lasalle st.	3	" "
Van Buren st., Wells st. to Market st.	7	" "
Archer road, State st. to Lock st.	66	" "
Michigan av., 18th st. to 22d st.	11	" "
4th av., from 12th st. 400 ft. South.	3	Lamps erected.
Indiana av., from 60 ft. South of 25th st. to 60 ft. North of 29th st.	10	" "

WEST DIVISION.

WHERE ERECTED.	No. Posts	REMARKS.
Warren st., Reuben st. to Robey st.	20	Completed.
Adams st., Rucker st. to within 250 ft of Morgan st.	8	"
Monroe st., Canal st. to Halsted st.	14	Two lamps erected.
Canal st., 16th st. to 18th st.	7	Six " "
18th st., Canal st. to Chicago river.	8	Five " "
Sangamon st., Van Buren st. to Tyler st.	5	No pipe laid.
Lincoln st., Hubbard st. to Fulton st.	10	" "
Lake st., Paulina st. to Leavitt st.	25	" "
Fulton st., Robey st. to Lincoln st.	3	" "
Wood st., Hubbard st. to Lake st.	14	" "
Hubbard st., Wood st. to Lincoln st.	3	" "
Carrol st., Halsted st. to Desplaines st.	5	" "
Throop st., from Van Buren st. to Jackson st.	3	Assessment made.
Washington st., from Wood st. to Lincoln st.	4	Lamps erected.
West Water st., from Kinzie st. to Indiana st.	7	Lamps erected.
Adams st., from 347 ft. West of Throop to Laflin st.	7	No pipe laid.

NORTH DIVISION.

WHERE ERECTED.	No. Posts	REMARKS.
Oak st., Green Bay st. to Lake Michigan.	3	Lamps erected.
North Dearborn st., Maple st. to Division st.	4	Three lamps erected.
Carr st., Superior st. to Hinsdale st.	5	Assessment made.

In conclusion, we invite your attention to the financial statement at the close of the report, exhibiting the expenditures of the Board in detail, and to the accompanying report of the City Engineer.

Respectfully submitted,

J. G. GINDELE,	}	<i>Board of Public Works.</i>
FRED. LETZ,		
O. J. ROSE,		

REPORT OF CITY ENGINEER.

CHICAGO, April 1st, 1865.

To the Board of Public Works:—

GENTLEMEN:—In respectfully presenting this, his fourth annual report, the City Engineer would follow the usual order in mentioning the different works the Board have placed under his charge:—

WATER WORKS.

These have, in their different branches, received unusual attention and, in some instances, caused unusual anxiety during the past year. Their general condition is constantly improving, but, in some cases, renewals and enlargements will be necessary very soon in consequence of the rapid growth of the city, the decay of materials, and accretions on the Lake Shore. These will be particularly described under the heads of Pumping Works, Inlet Basin, and Main Pipes.

PUMPING WORKS.

These, including their performances during the past year, their present condition, and future requirements, will be found fully described in the following report of the engineer in charge of them:—

REPORT OF ENGINEER OF PUMPING WORKS.

PUMPING DEPARTMENT, }
CHICAGO, April 1st, 1865. }

E. S. Chesbrough, Esq., City Engineer:—

SIR:—I have the honor to submit the following report of the operations of this department for the year ending March 31st:

The quantity of water pumped during the past year amounts to 2,523,339,220 gallons; exceeding the quantity pumped last year over 187,000,000 gallons.

Of the whole quantity, the	Gallons.
Large engine pumped -----	1,481,044,080
Small do do. -----	1,042,295,140
Being an average daily quantity of -----	6,913,258

The engines have been in operation a portion of every day throughout the year.

The large engine has been in use 206 days, an average of $16\frac{21}{60}$ hours per day.

The small engine has been run 159 days, an average of $18\frac{52}{60}$ hours per day.

The total actual running time being $6370\frac{3}{60}$ hours.

The whole amount of coal received during the	Tons.
past year was -----	3505 $\frac{1475}{2000}$
Amount on hand April 1st, 1864, -----	759 $\frac{1030}{2000}$
Of this am't there has been used for pump'g, $3149\frac{215}{2000}$	
do do. for keeping steam when stopped, $117\frac{1800}{2000}$	
For pipe laying, workshop, stoves, etc., ----- $119\frac{1640}{2000}$	
On hand April 1st, 1865, ----- $795\frac{570}{2000}$	
Apparent shrinkage, ----- $83\frac{280}{2000}$	
	<hr/>
	4265 $\frac{505}{2000}$ 4265 $\frac{505}{2000}$

The following record will exhibit the aggregate operations of engines and boilers each month during the past year:—

MONTHS.	Average Gallons Water pumped per day.	Total Gallons Water pumped per month.	Average lbs. of Coal consumed per day.	Total lbs. of Coal consumed per month.
April, 1864, --	5,933,772	178,013,170	15,690	470,710
May, " --	6,499,071	201,471,216	17,259	535,020
June, " --	7,693,819	230,814,576	18,995	569,850
July, " --	7,200,894	223,227,723	17,057	528,775
August, " --	8,293,850	257,109,360	22,124	685,850
Sept. " --	7,904,568	237,137,038	20,976	629,285
October, " --	6,178,971	191,542,516	15,739	487,915
Nov. " --	5,501,101	165,033,042	16,012	480,385
Dec. " --	6,711,128	208,044,966	17,988	557,640
Jan'y, 1865, --	7,488,116	232,131,600	19,924	617,640
Feb'ary, " --	6,758,741	189,244,751	16,514	462,390
March, " --	6,760,299	209,569,260	16,405	508,555

TABLE SHOWING THE QUANTITY OF WATER PUMPED EACH MONTH,

From January 1st, 1858, to March 1st, 1865.

MONTHS.	1858.	1859.	1860.
January, -----	81,538,179	106,905,665	132,284,454
February, -----	69,426,515	106,401,412	130,800,720
March, -----	82,677,463	102,415,983	150,331,680
April, -----	82,600,782	89,994,235	132,930,546
May, -----	82,279,920	116,007,263	141,171,078
June, -----	90,211,505	113,098,416	148,197,024
July, -----	101,670,736	133,800,336	166,394,640
August, -----	107,176,652	123,266,556	152,427,690
September, -----	108,534,540	131,735,847	132,272,202
October, -----	101,046,605	141,527,040	148,710,195
November, -----	86,385,840	127,342,018	150,493,248
December, -----	98,316,722	122,653,139	130,773,075
TOTAL, -----	1,091,865,457	1,415,147,910	1,716,786,552

MONTHS.	1861.	1862.	1863.
January, -----	137,651,918	151,971,047	169,900,255
February, -----	142,071,067	168,931,783	158,108,450
March, -----	135,576,447	192,937,942	159,930,404
April, -----	128,371,178	170,081,570	Hereafter the year commences on the first day of April.
May, -----	150,489,168	181,483,032	
June, -----	155,996,352	199,113,518	
July, -----	147,182,793	209,215,872	
August, -----	168,602,494	195,588,295	
September, -----	152,710,186	186,902,888	
October, -----	149,362,166	199,045,045	
November, -----	153,879,648	187,002,720	
December, -----	145,261,272	175,006,027	
TOTAL, -----	1,767,154,689	2,217,279,739	487,939,109

MONTHS.	1863-4.	1864-5.
April, -----	173,519,952	178,013,170
May, -----	193,119,348	201,471,216
June, -----	194,255,701	230,814,576
July, -----	209,332,677	223,227,723
August, -----	217,561,920	257,109,360
September, -----	217,229,652	237,137,038
October, -----	185,678,001	191,542,516
November, -----	176,132,600	165,033,042
December, -----	199,592,696	208,044,966
January, -----	209,884,992	232,131,600
February, -----	176,088,647	189,244,751
March, -----	183,712,268	209,569,260
TOTAL, -----	2,336,108,454	2,523,339,218

THE AVERAGE DAILY QUANTITY PUMPED FOR THE ABOVE
YEARS, WAS:—

1858,-----	2,991,412	galls.
1859,-----	3,877,118	"
1860,-----	4,703,525	"
1861,-----	4,841,547	"
1862,-----	6,074,739	"
1863-4,-----	6,382,810	"
1864-5,-----	6,913,258	"

The following tables exhibit in detail the operations of engines, pumps, and boilers, during the year just closed:—

MONTHS.	No. of days run.	No. of hours and Minutes run.	Ave. No. of hours run per day.	Ave. galls of water pumped per day.	Total galls water pumped per month.	Pounds Coal consumed for pump'g.	Pounds Coal consumed when at rest.	Total Coal used per month.	Total Revolutions per month.
1864.		H. M.	H. M.	LARGE	ENGINE.				
April,.....	11	148 15	13 28	5,742,637	63,169,008	169,275	8,800	178,075	77,413
May,.....	31	466 06	15 02	6,499,071	201,471,216	507,120	27,900	535,020	246,901
June,.....	30	517 50	17 15	7,693,819	230,814,576	545,650	24,200	569,850	282,861
July,.....	6	98 33	16 25	6,855,080	41,130,480	105,230	3,200	108,430	50,405
August,.....	31	587 45	18 57	8,293,850	257,109,360	669,750	16,100	685,850	315,085
September,.....	19	332 54	17 31	8,347,207	158,596,944	400,060	10,000	410,060	194,359
November,.....	19	269 25	14 11	5,490,005	104,310,096	301,315	17,700	319,015	127,831
December,.....	28	445 25	15 54	6,868,243	192,310,800	489,935	28,400	518,335	235,675
January, 1865,	31	503 00	16 13	7,488,116	232,131,600	589,840	27,800	617,640	284,475
TOTALS,.....	206	3,369 15	16 21	7,189,534	1,481,044,080	3,778,175	164,100	3,942,275	1,815,005
1864.				SMALL	ENGINE.				
April,.....	19	341 22	17 58	6,044,429	114,844,162	282,435	10,200	292,635	221,265
July,.....	25	518 44	20 45	7,283,889	182,097,243	412,345	8,000	420,345	350,997
September,.....	11	217 46	19 48	7,140,008	78,540,094	212,725	6,500	219,225	151,388
October,.....	31	564 20	18 48	6,178,791	191,542,516	472,015	15,900	487,915	369,203
November,.....	11	185 44	16 53	5,520,267	60,722,946	155,470	5,900	161,370	117,045
December,.....	3	48 15	16 05	5,244,722	15,734,160	38,305	1,000	39,305	30,328
February, 1865	28	537 53	19 13	6,758,741	189,244,752	450,990	11,400	462,390	364,774
March, ..	31	586 40	18 55	6,760,299	209,569,261	495,755	12,800	508,555	403,950
TOTALS,.....	159	3,000 50	18 52	6,555,641	1,042,295,140	2,520,040	71,700	2,591,740	2,009,050

RECAPITULATION.

ENGINES.	No. of Days run.	No. of hours and Minutes.	Total galls. water pumped.	Pounds of Coal consumed for pump'g.	Pounds of Coal consumed when not running.	Total pounds of Coal used.	Total No. of Revolutions.
Large,	206	H. M.	1,481,044,080	3,778,175	164,100	3,942,275	1,815,005
Small,	59	3,000 50	1,042,295,140	2,520,040	71,700	2,591,740	2,009,050
TOTAL,	365	6,370 03	2,523,339,220	6,298,215	235,800	6,534,015	3,824,055

The expenses properly due to pumping, during the year, were as follows:—

Salaries of Engineers, Firemen, and others,-----	\$7,266.48
3293 ¹⁰¹⁵ ₂₀₀₀ tons of coal, at an average of \$9.94 per ton,	32,737.47
233 $\frac{1}{2}$ gallons of oil,-----	351.96
1098 pounds tallow,-----	170.53
Packing, waste, etc., etc.,-----	347.07
Gas for lighting Works,-----	137.19
Repairs to machinery,-----	984.65
Total,-----	<u>\$41,995.35</u>
Cost of delivering water, per million gallons,-----	\$16.64

This shows the cost of pumping water during the past year to be about 42 per cent more than the previous year. However, even this excess may be regarded as a favorable record, as the principal material entering into the operation of pumping the past year cost an average of over 53 per cent more than like material during the year referred to. It is proper to add that a portion of the coal used during the past year was of an inferior quality.

THE WORKSHOP

May now be regarded as a permanency, since the convenience and profit accruing from it has become an important auxiliary in connection with the various departments under control of the Commissioners.

During the past year 157 new fire hydrants, of the peculiar style adopted by the city, have been manufactured, besides a number of old ones repaired. 102 new stop-valves have been made, of various sizes, viz.:—

52 four-inch,	13 eight-inch,
34 six-inch,	3 twelve-inch.

In addition to the above work, a large amount of repairing has been done for bridges and other city departments.

The total expenditures for labor and material in the foregoing work, is-----	\$10,039.76	
Add for interest, depreciation, etc.,-----	324.00	
Value of work turned out, based on current prices for like articles,-----		13,554.52
Leaving a balance, as earnings for the year,-----	3,190.76	
	<hr/>	<hr/>
	\$13,554.52	\$13,554.52

There are remaining on hand, 11 new fire hydrants, 12 new 4-inch stop-valves, 17 new 6-inch stop-valves, and 1 new 12-inch stop-valve.

The value of these, including the raw material on hand, amounts to-----	\$1,840.74
Value of shop tools, patterns, etc., -----	1,800.00
Total,-----	<hr/>
	\$3,640.74

Old iron, consisting of broken pipe, cocks, and hydrants, has been sold during the year, amounting to \$335.28, which sum should be deducted from the cost of like new work, as above.

The property at the pumping works is the same as at the last report, except old steam piston and rod, formerly belonging to large engine. The value of stores, viz., oil, tallow, waste, packing, &c., remaining on hand, from those purchased the past year, amounts to \$141.50.

PUMPING WELL, INLET BASIN, ETC.

On the 17th of February last, the water was shut off from the city a few hours, for the purpose of cleaning the pump well. During the time, the reservoirs were kept full, and the usual precautions taken to provide a full supply, in the event of fire occurring.

During the cold weather of last winter, great quantities of "field ice" formed upon the surface of the lake, and, owing to the prevalence of high winds, it was driven towards the West shore, forming one vast "icepack," several feet above the sur-

face of the lake, and extending miles along the shore. This accumulation of ice entirely excluded the water from the "inlet basin," and, for a time, threatened the supply to the city. Measures were immediately taken to cut a channel through the "pack" (which required several hours labor to accomplish), which was afterwards kept open. The usual quantities of small fish also appeared during the winter, but by diligent watching, day and night, serious annoyance was prevented.

With these exceptions, and the escape of the buildings of the pumping works from damage by the fire which destroyed Lill & Diversey's brewery, in June last, nothing has occurred during the year tending to interrupt the supply. The engines and boilers are in fair condition.

During the year the large engine was fitted with a new steam piston and rod. The small engine has received no repairs of importance. Some slight expenditures have also been made upon the boiler.

In order to render the condition of the engines entirely satisfactory, it will be necessary to make further repairs. However, they will be deferred, if possible, until the proposed additional engine can be completed. This will afford ample facilities for doing work which we do not now possess.

NEW ENGINE.

In my last annual report, I had the honor to briefly allude to the necessity which seemed to exist for additional pumping machinery; also to the steps which had been taken in the matter. Further consideration has been given the matter during the past year.

A general plan for the engine and pumps has been prepared and submitted to a number of distinguished engineers, here and elsewhere, each of whom has expressed favorable opinions, with reference to the simplicity, efficiency, and general practicability of the design. The plan contemplated a capacity to deliver 1,000,000 gallons of water per hour, or 24,000,000 daily. This quantity was deemed unnecessarily large at this time, and in consideration of a saving of over \$20,000 in the first cost, the

proportions were subsequently reduced to a capacity of 18,000,000 gallons per day, on the same general plan.

The style of the engine proposed, may be termed a condensing coupled-beam engine, with direct double acting pumps, capable of delivering the quantity of water alluded to above, under a head of 125 feet in 24 hours. For this purpose, the design embraces two steam cylinders, each 44 inches in diameter, and adapted to 8 feet stroke of piston. Two double acting pumps, each 28 inches in diameter, with stroke same as steam cylinders, are placed in a vertical position, directly below the steam cylinders, at a point entirely below the surface of the water in pump wells. The steam piston rods extend through bottom of cylinders and top of pumps, connecting to water pistons, thus forming a continuous rod from its connection with the working beams to pistons of pump. The cylinders, pumps, and other parts are firmly secured to massive plates, which are fastened to the foundation. The receiving and delivery valves of the main pumps, are of the kind known as Cornish valves. The action of this style of valve, under heavy pressure, is generally regarded among hydraulic engineers as possessing peculiar advantages. They are generally arranged with two beats. Those for the large pumping engine at Cincinnati have three beats. Those intended for the engine under consideration, were designed by Mr. Edward Faron, of New York City, and are provided with four differential beats. The working beams are of cast-iron, 18 feet long, resting upon entablatures supported by eight Tuscan columns. The connecting rods are of wrought-iron, extending from the beams to the cranks, which are set at right angles with each other, upon a wrought-iron shaft which drives a fly-wheel, 24 feet in diameter, arranged with a heavy rim and eight skeleton arms. The air-pumps and condensers are located below the main floor of the building, upon bed-plates. The former are operated by the working beams; the latter form a support for the pedestals and columns. The engine is fitted with Winter's patent adjustable rotary cut-offs, of the most approved construction.

Such is a brief outline of the principal parts of the proposed engine, which is intended to be, and as here described is, nominally, one engine, although it will be found, by referring to the detailed specifications, that the various parts are so arranged that it may, in fact, be rendered two independent engines.

Some theoretical advantage might be gained, had the desired capacity been represented by one steam cylinder and one pump (a single engine). However there are circumstances, peculiar to our works, which should be considered in this connection. It is unnecessary to detail them here, but I am of the opinion that, when fairly viewed, the practical advantages of the combination proposed will outweigh those claimed for the single engine. One additional boiler only will be required, as it will be used in connection with those now in use. The general dimensions of the boiler have been determined, but its exact form and arrangement will be governed somewhat by the location.

The *duty* developed by the engine will, in a great measure, depend upon the efficiency of the boiler. It is important, therefore, that it should embrace, in its construction, such reliable improvements as aim at practical economy—especially such as tend to a thorough combustion of fuel—and thus prevent the escape of the usual volumes of smoke, resulting from the use of bituminous coal. Independent of the economy claimed in this particular, the prevention of smoke itself would be a desirable feature, and a step towards abating an increasing annoyance.

The limited dimensions, as well as the dilapidated condition of the buildings of the pumping works, render it necessary to provide an additional location for the proposed new machinery. This is a matter of the highest importance, and a perplexing question to decide. Yet, in view of the exigency which exists for the new engine, it is one demanding prompt and careful consideration. The limits of this report will not admit of reference in detail, to the plans which have been suggested to meet this requirement, but the essential points governing the adop-

tion, and the difficulties attending the execution of them, may be briefly alluded to.

The first expedient which naturally presents itself for the purpose, is to extend the present engine foundation, and enlarge the buildings sufficiently to accommodate the new engine.

To construct foundations for the new engine, will require excavations to a depth of 25 to 30 feet below the surface in order to form a proper pump well, and those who are familiar with the peculiar character of the soil in this locality, will fully comprehend the character of the work to be done. But when, in addition to the natural difficulties incident to building in quicksand, we consider the excavations referred to must be made within a few feet of three brick towers, from 80 to 140 feet high, resting upon sand near the surface, and that an accident to either of them, or damage to the walls of the present building, would, in all probability, deprive the city of water for some time, the work becomes too critical to be attempted in an ordinary way. It is presumed no argument is needed to demonstrate the importance of guarding against a contingency of the kind, nor of the evil consequences which might follow such an event. It is obvious then, that whatever plan may be adopted for providing the new foundation, &c., the efficiency of the present pumping works becomes a matter paramount to all others. Any proposition, therefore, which includes a probability of risk to the supply of water, may be entirely dismissed from consideration.

It is believed, however, notwithstanding the obstacles which present themselves, that with extraordinary precautions the proper foundation can be constructed and most of the risk alleged above avoided by building a curb of proper form and dimensions for the pump well upon the surface, and by excavating within the walls, sink it to the depth required. The towers, walls, &c., alluded to would be secured against damage and if deemed feasible will probably be found to incur less expense than any other plan yet suggested.

Another plan proposed, and one which would eventually

prove the most satisfactory, is that of constructing foundations and pump wells, and erecting buildings, upon a new site, entirely independent of, and about 200 feet east of, those now in use.

This proposition would probably incur greater expense than the other, but would be less likely to interfere with the operations of the present works, than any other which could be carried out on the same plat of ground. This plan would provide foundations and buildings sufficient to accommodate all the pumping machinery, including the engine under consideration, the two now in use, and room for still another, when required. The design would be, first, to erect the proposed new engine, to supply the city with water, which would afford opportunities to remove the old engines to the new site. This done, the old building, being of no further use, could be razed, and the space tastefully graded, presenting a park 200 feet square.

If this proposition should be favorably entertained, and the new works constructed in a substantial manner, liberal in proportions, and with a degree of beauty which characterizes structures of the kind everywhere, containing, as they would, pumping machinery capable of supplying 40,000,000 gallons of water daily, also the "shore shaft" of the Lake Tunnel, they would be justly entitled to a location in the heart of the metropolis of the Great West, and an enduring evidence of the wealth, taste, and energy of her citizens. Besides, past experience clearly establishes the fact, that the extension of the pumping works, now deemed essential, should be of sufficient magnitude to provide for the future growth of our city, whether rebuilt upon the present or upon a new site. That the question should be decided at an early day, cannot be too strongly urged.

Respectfully,

DEWITT C. CREGIER, *Engineer.*

For reasons given in previous reports, the engine planned by Mr. Cregier, and so satisfactory to the most competent judges, should be constructed without delay. The average daily con-

sumption for the past year was 530,448 gallons more than that of the year previous. There is no probability that this rate of increase will be diminished, but there is a possibility that it will be greater, especially if new manufacturing establishments should spring up in our city.

In consequence of other questions connected with the public works of the city requiring immediate attention, there has not been time yet to elaborate fully the necessary plans for the connections between the New Engine and the Lake Tunnel and the Inlet Basin, but it is hoped there will be an opportunity before long to take them up. In the meantime, it would be advisable to secure the construction of the new engine before next winter.

INLET BASIN.

This was found to be filling up so rapidly as to make it necessary to dredge out a considerable portion of it last season. The depth of water in the lake had become so small as to prevent the dredge from getting to the basin until it cut a channel. Had this dredging not been done, which was looked upon at the time more as a prudent precaution than as an absolute necessity, there is every reason to believe that serious inconvenience might have resulted several times the past winter, in consequence of the unusually low average stage of water and the occasional prevalence of very strong southerly winds.

In addition to the low water, another, and, in the experience of the water works, entirely new trouble occurred. It was the formation of an ice ridge nearly parallel with the shore, and about 200 feet outside of the inlet basin, cutting off the latter so effectually from its connection with the lake as to make it necessary to stop the pumps for want of water. This was a source of much anxiety, and as Mr. Cregier mentions, required at times watchful care, and much labor night and day to prevent the supply to the city from being cut off.

In view of the foregoing experience it is recommended that the breakwater of the inlet basin be extended out on the north side at least 600 feet during the present season, and then such

further dredging for the entrance to the basin to be done as may be found necessary.

MAIN PIPES.

During the past year, the new main 24 inches in diameter, on Wabash avenue, between Adams and Twenty-second streets, was laid, and connections made between it and the distributing pipes on Hubbard court, Twelfth street, and Twenty-second street. Previous to the completion of this work complaints of the scarcity of water, in the South Division, south of Adams street, were very frequent and annoying, but immediately after they ceased entirely. Notwithstanding this great improvement, however, it must be confessed that Chicago is far behind the principal cities of the country in the proportion of its large main to its distributing pipes. So far as the supply for domestic and manufacturing purposes is concerned, there is now but little or no just cause of complaint; but with regard to the speedy extinguishment of fires, some parts of the city are much more exposed than others. This could not be wholly prevented in a city growing so rapidly, and, in some sections so sparsely built upon, as ours, it is of course a question how far the city should make large expenditures on this account, but being an eminently practical question, it is well worthy of the consideration of the Board.

DISTRIBUTING PIPES.

There were laid, during the year ending March 31st, 1865, the following main and distributing pipes, viz.:

SOUTH DIVISION.

ON WHAT STREET.	BETWEEN WHAT STREETS.	Diameter in inches.	Length in feet.
Hardin place -----	Cottage Grove avenue and Prairie avenue	4	1,478
Prairie avenue -----	Hardin place and Twenty-fifth -----	6	2,000
Prairie avenue -----	Twenty-fifth and northward -----	4	229
Twenty-Sixth -----	Prairie avenue and Calumet avenue -----	4	426
Twenty-First -----	State and east of Wabash avenue -----	4	712
Purple -----	Archer road and Elgin -----	6	134
Elgin -----	Purple and Stewart avenue -----	4	1,075
Wabash avenue -----	Adams and Twenty-second -----	24	9,817
Fourteenth -----	Wabash avenue and westward -----	6	55
Sixteenth -----	Wabash avenue and eastward and west'd	8	160

SOUTH DIVISION, continued.

ON WHAT STREET.	BETWEEN WHAT STREETS.	Diameter in inches.	Length in feet.
Twelfth -----	Wabash avenue and eastward -----	8	60
Twelfth -----	Wabash avenue and westward -----	12	90
Archer road -----	Grove and Stewart avenue -----	8	1,294
Stewart avenue -----	Archer road and north of Twenty-first -----	8	857
Twenty-First -----	Clark and Stewart avenue -----	8	1,874
Purple -----	Twenty-first and southward -----	6	50
Grove -----	Todd and southward -----	4	329
Broad -----	Archer rd. and south'd to Wahl's factory -----	4	1,362
Deering -----	Archer road and Cologne -----	6	1,260
Deering -----	Cologne and north'd to Hancock's pkg. h. -----	4	135
Arnold -----	Archer road and Twenty-second -----	4	658
Calumet avenue -----	Twenty-first and Twenty-second -----	4	506
Eighteenth -----	Clark and Arnold -----	4	250
Fourteenth -----	Wabash avenue and State -----	8	535
Archer road -----	Main and Pitney -----	6	2,883
Eighteenth -----	Prairie avenue and eastward -----	4	354
	Hydrants -----	4	352
			28,935

WEST DIVISION.

ON WHAT STREET.	BETWEEN WHAT STREETS.	Diameter in inches.	Length in feet.
Carroll -----	Paulina and Wood -----	4	740
Desplaines -----	Lake and northward -----	6	106
Jackson -----	Morgan and Aberdeen -----	6	730
Union -----	Lake and north and south -----	6	150
Madison -----	Throop and Reuben -----	8	2,057
Foster -----	Harrison and northward -----	4	562
Harrison -----	Desplaines and Blue Island avenue -----	4	946
DeKoven -----	Clinton and Jefferson -----	4	407
Fulton -----	Ann and Elizabeth -----	4	629
Morgan -----	Polk and Twelfth -----	8	1,669
Twelfth -----	Halsted and Blue Island avenue -----	8	1,729
Waller -----	Twelfth and southward -----	6	60
Sampson -----	Rucker and Loomis -----	4	1,402
Rucker -----	Twelfth and Mitchell -----	6	1,327
Brown -----	Twelfth and southward -----	4	314
Milwaukee avenue -----	Augusta and Cornell -----	6	1,033
Wabansia avenue -----	The River and Elston road -----	6	1,326
Elston road -----	Wabansia avenue and northward -----	6	696
Jefferson -----	Lake and northward -----	4	138
Mitchell -----	Rucker and Lincoln -----	6	4,759
Lincoln -----	Mitchell and C. B. & Q. R. R. -----	6	1,115
Washington -----	Hoyne and Western avenue -----	4	2,000
Western avenue -----	Washington and northward -----	4	234
Paulina -----	Chicago avenue and Clarinda -----	4	480
Chicago avenue -----	Reuben and Paulina -----	6	666

Amount carried forward ----- 25,275

WEST DIVISION, continued.

ON WHAT STREET.	BETWEEN WHAT STREETS.	Diameter in inches.	Length in feet.
	Amount brought forward-----		25,275
Taylor-----	Blue Island avenue and Newberry-----	6	785
Jefferson-----	Wright and southward-----	6	185
Aberdeen-----	Monroe and Madison-----	4	476
Robey-----	Walnut and northward-----	6	173
Park avenue-----	Lincoln and westward-----	4	241
Park avenue-----	Reuben and westward-----	4	281
Leavitt-----	Warren and north of Washington-----	6	554
May-----	Madison and Washington-----	6	505
O'Brien-----	Jefferson and Halsted-----	4	1,303
Halsted-----	Catharine and south of Canal Port avenue-----	6	2,703
Canal Port avenue-----	Halsted and east and west-----	6	85
Canal-----	Twelfth and Taylor-----	6	935
McHenry-----	Wabansia and Rawson-----	4	520
Rawson-----	McHenry and eastward-----	4	623
	Hydrants-----	4	624
Total-----			35,268

NORTH DIVISION.

ON WHAT STREET.	BETWEEN WHAT STREETS.	Diameter in inches.	Length in feet.
Halsted-----	Willow and northward-----	6	829
Larrabee-----	Willow and Centre-----	6	1,485
Robert-----	Chicago avenue and southward-----	4	270
Little Fort road-----	Sedgwick and Wisconsin-----	4	948
Elm-----	Extension eastward of Green Bay-----	4	161
Geary-----	Hinsdale and White-----	4	316
Green Bay road-----	Cane and City Limits-----	4	1,107
Pearson-----	Market and westward-----	4	234
Mohawk-----	Clybourn avenue and Blackhawk-----	4	1,461
Loewe-----	Wells and westward-----	4	554
Oak-----	Wells and Lasalle-----	4	410
Elm-----	Franklin and Wells-----	4	426
	Hydrants-----	4	70
Total-----			8,271

The total length of pipe laid in the whole city during the year, was 13 miles and 3,834 feet.

The total length of pipes of different sizes, in the city, as near as can be ascertained, is as follows, viz.:—

24 inch cast iron main pipe, -----	22,082 feet.
16 " " " " " -----	10,610 "
12 " " " " " -----	9,830 "
30 " wrought iron river pipe, State street,--	280 "
24 " " " " Chicago avenue,	236 "
24 " " " " Rush street,--	530 "
12 " " " " Adams street,	176 "
12 " cast iron distributing pipe,-----	454 "
10 " " " " " -----	7,862 "
9 " wrought " and siphon pipe,	
on Archer road, -----	90 "
8 " cast iron distributing pipe,-----	57,553 "
6 " " " " " -----	226,314 "
4 " " " " " -----	328,770 "
3 " " " " " -----	30,388 "

695,175 feet,

or 131 miles and 3495 feet.

HYDRANTS.

During the year, the following new hydrants have been put in, viz.:—

SOUTH DIVISION.

- 1 East side Wells at the river.
- 1 " Lasalle between Washington and Madison, Eng. Ho.
- 1 " Purple opposite end of Elgin.
- 1 S. W. corner Archer road and Main.
- 1 South side Archer road opposite end of Bonfield.
- 1 " " " " " Church place.
- 1 S. W. corner " " and Broad.
- 1 North side Twenty-first between Purple and Stewart avenue.
- 1 West " Stewart avenue opposite end of Twenty-first.
- 1 S. W. corner Hickory and Deering.
- 1 West side Benson near Wahl's glue factory.
- 1 N. W. corner Calumet avenue and Twenty-ninth.

- 1 West side Prairie avenue bet. Twenty-sixth and Twenty-ninth
- 1 North side Archer road opposite end of Hanover.

WEST DIVISION.

- 1 East side Jefferson, between Washington and Madison.
- 1 N. W. corner Lake and Desplaines.
- 1 North side Lake, between Clinton and Jefferson, Engine Ho.
- 1 N. E. corner Madison and Loomis.
- 1 N. E. " Milwaukee avenue and Fourth.
- 1 N. W. " Mitchell and Throop.
- 1 N. W. " Mitchell and Laffin.
- 1 N. W. " Sampson and Throop.
- 1 N. W. " Sampson and Loomis.
- 1 West side Halsted op. end of Eighteenth.
- 1 N. W. corner Clinton and Twelfth.
- 1 N. W. " Morgan and Twelfth.
- 1 N. W. " Morgan and Eleventh.
- 1 N. W. " Rucker and Coolidge.
- 1 N. W. " Loomis and Mitchell.
- 1 N. W. " Rucker and Mitchell.
- 1 N. W. " Canal and DeKoven.
- 1 North side Harrison bet. Blue Island avenue and Desplaines.
- 1 N. W. corner Twelfth and Johnson.
- 1 West side Western avenue bet. Washington and Union Park.
- 1 N. W. corner Chicago avenue and Paulina.
- 1 N. W. " Paulina and Clarinda.
- 1 North side Taylor between Blue Island avenue and Halsted.
- 1 S. W. corner Canal Port avenue and Halsted.
- 1 N. W. " Union and Sixteenth.
- 1 N. W. corner Washington and Hoyne.
- 1 N. E. " " " Western avenue.
- 1 North side Milwaukee avenue opposite end of Cornelia.
- 1 " " " " Augusta.
- 1 N. W. corner Wabansia " and Elston road.
- 1 North side " " opposite end of McHenry.
- 1 West side Elston road north of Wabansia avenue.
- 1 N. W. corner Fulton and Elizabeth.

- 1 North side Madison opposite end of Laflin.
- 1 N. W. corner Canal Port avenue and Jefferson.

NORTH DIVISION.

- 1 West side Milwaukee avenue near Nicholson's distillery.
- 1 S. W. corner Green Bay road and Fullerton avenue.
- 1 N. W. " Mowhawk and Blackhawk.
- 1 West side Dearborn between Huron and Superior.
- 1 N. E. corner Little Fort road and Centre.
- 1 N. W. " Larrabee and Centre.
- 1 West side " between Centre and Willow.
- 1 " Halsted " " " "
- 1 " Kingsbury opposite end of Illinois.

In all 58, making the total number in and belonging to the city, April 1st, 606.

90 hydrants were taken out and renewed; 12 received more or less repairs. All of the new hydrants are of the Cregier patent, which continue to give the satisfaction they promised: as they saved the shutting off of water from important districts quite often during the year,—which shutting off could not have been avoided with the old form of hydrant, especially in the case of stones or chips getting caught in the valves.

The work of connecting the hydrants with the sewers has been continued; over 160 in all being thus connected. Of 557 cases of hydrants being frozen and thawed out last winter, only four occurred with hydrants connected with the sewers, and in those cases the drains were evidently obstructed; thus showing that the warm air from the sewers is sufficient to keep the hydrants from freezing, if it can be tolerably well confined around them.

STOP COCKS.

The following stop cocks have been put in during the year, viz.:

SOUTH DIVISION.

- 1 4 in., Couch place between Lasalle and Wells.
- 1 4 in., " " " Wells and Franklin.
- 1 4 in., " " " Franklin and Market.

1	4 in.,	Third avenue bet. Jackson and Van Buren:		
1	4 in.,	Twenty-first east side of State.		
1	6 in.,	Archer road west side of Main.		
1	8 in.,	Stewart avenue south side of Twenty-second.		
1	8 in.,	Fourteenth west side of Wabash avenue.		
1	8 in.,	Fourteenth east side of	"	
1	8 in.,	Twenty-second west side of	"	
1	8 in.,	" east	"	"
1	8 in.,	Twelfth	"	"
1	12 in.,	" west	"	"
1	8 in.,	Hubbard court	"	"
1	8 in.,	" east	"	"
1	8 in.,	Sixteenth west	"	"
1	8 in.,	" east	"	"
1	8 in.,	Ontario west	"	Wells.
1	24 in.,	Wabash avenue south	"	Adams.

WEST DIVISION.

1	4 in.,	Fulton west side of Elizabeth.		
1	4 in.,	Brown south	"	Twelfth.
1	4 in.,	Sampson west	"	Rucker.
1	6 in.,	Rucker north	"	Kinzie.
1	6 in.,	Waller south	"	Twelfth.
1	6 in.,	Mitchell west	"	Rucker.
1	6 in.,	Halsted south	"	North.
1	6 in.,	Canal Port avenue west side of Halsted.		
+	1 6 in.,	Mitchell west side of Lincoln.		
1	8 in.,	Twelfth	"	Halsted.
1	4 in.,	Chicago avenue west side of Reuben.		
1	4 in.,	Leavitt north side of Madison.		

NORTH DIVISION.

1	4 in.,	Elm west side of Wells.		
1	6 in.,	Larrabee north side of Centre.		
1	8 in.,	Ontario west	"	Wells.

In all 34, making, together with those previously put in, 332 in the city. The balance of the stop cocks reported by Mr.

Cregier as made at the shop were used either for renewing old ones or for water meters.

THE WORKSHOP.

In addition to what Mr. Cregier has said, it may be stated the workshop has undoubtedly been of very important advantage, in the extension and repairs of the main and distributing pipes, during the past year.

RESERVOIRS.

These are internally, in about as good a condition as they were in a year ago.

Externally the west reservoir has been much improved in being surrounded by a neat and substantial iron fence, and by grading up the surface of the lot.

QUALITY OF THE WATER.

This has been occasionally very bad during the year, but no worse than it has been at times for several years past. No permanent relief is expected before the completion of

THE LAKE TUNNEL.

This work has reached from the land shaft a distance of 2,125 feet. The character of the ground has continued to be about the same, and the average rate of progress for weeks at a time has been 12 feet a day. Occasional interruptions from the breakage of machinery, strikes among the workman, the meeting with and occasional explosion of gas, and other causes have prevented this average rate all the time; and have reduced it for the year to $9\frac{1}{10}$ feet a day.

The discussions mentioned in the last annual report, relative to the size of the tunnel resulted in keeping it the same as mentioned in the contract, that is 5 feet wide and 5 feet 2 inches high, the top and bottom being semicircular.

The back filling between the regular brick work and the irregular surface of the excavation, which was to have been of well packed earth, has been made of masonry, because it was

found very difficult to get the puddled clay used faithfully packed into the spaces. Ordinarily the ground is so good that an average of one inch of cement mortar between the bricks and the natural clay is all that is required.

A tendency in the clay to swell was very early discovered and for a time some possible trouble from this source was feared, but thus far the masonry has resisted all tendency to yield, so that all apprehensions of this kind for the first finished portions of the tunnel have ceased.

This tendency in the clay to swell has made it very troublesome to preserve the grade of the tunnel with great accuracy, because the amount of swelling has been so different, in different parts of the work. The small size of the tunnel together with the great difficulty of getting a clear atmosphere in it has made the alignment of it very troublesome; but Mr. Clarke who has taken charge of the alignment has met with very satisfactory success.

In order to facilitate the work of the tunnel, chambers and turn-tables are placed once in a thousand feet. In these chambers materials are stored and cement is mixed. They also afford passing places for the cars, so that the work is carried on at a greater average rate now than at first, not because it is any easier, but because the contractors and their men have had more experience.

The outer crib, notwithstanding the expectations expressed a year ago, has not yet been launched, but is very nearly ready and there is every reason to believe it will be put in its place during the favorable weather that may be expected the approaching season.*

* At the date of going to press, August 25, the excavation of the Tunnel from the land shaft, has reached a distance of 3,505 feet. The masonry is about 25 feet back of this. An average rate of 14 feet a day has been made occasionally for a week at a time.

The use of iron instead of wooden rails, and of small mules instead of men for drawing the cars, has caused greater economy as well as speed.

SEWERAGE.

The report of the principal assistant, on the sewerage of the city, will be found immediately below, and presents all the information needed on this subject:—

CHICAGO, March 31, 1865.

To E. S. Chesbrough, Esq., City Engineer:

SIR,—I herewith submit a report of the operations during the past year of the Sewerage Department, of which I have had the charge. The sewers built have been chiefly submains and pipe sewers, for the purpose of filling up the vacancies between the main sewers which had been previously laid. The total length of sewers built during the year, is 25.021 lineal feet, or about $4\frac{3}{4}$ miles; making, with those previously built a total of $69\frac{2394}{5280}$ miles. The following tables show their distributions in the three districts:—

The ventilation of the first half mile of the tunnel, was effected by drawing the foul air out by a pipe connected with the chimney of the boiler furnace; but towards the last that method became so unreliable as to make something more efficient absolutely necessary. The ventilation is now very satisfactory, and effected by means of an Alden blower.

The crib was launched in a most gratifying manner on the 25th of July, and immediately towed out to its position. The work of sinking it was somewhat delayed in consequence of defective arrangements and accidents to the anchors. Owing to rough weather which occurred just as the crib reached bottom, but was not sufficiently loaded to hold firmly, much anxiety was felt for its safety, but by means of a wrecking pump it was filled nearly full of water, and thus kept very nearly in its true position. After the storm had subsided, the crib was found to have worked about 13 feet north of the correct line, and to have embedded itself thoroughly into the clay on the bottom of the lake. It was thought best not to attempt to raise it again, but to proceed immediately with filling it with stone, as the variation from the exact position intended, could be of no practical importance whatever in the use of the tunnel. The crib now contains upwards of 7,000 tons of stone, and will probably be entirely filled early next week.

A much severer storm than the first one has recently occurred, but it has had no appreciable effect on the crib.

The cylinders on the lake shaft are all here and ready to be taken to their position in the crib.

1864

LENGTH IN FEET OF SEWERS BUILT TO APRIL 1, 1865.

Diameter in feet	SOUTH DISTRICT.		NORTH DISTRICT.		WEST DISTRICT.		TOTAL FEET.
	Previous to April, 1864.	From April 1, 1864, to Ap'l 1, 1865.	Previous to April, 1864.	From April 1, 1864 to Ap'l 1, 1865.	Previous to April, 1864.	From April 1, 1864, to Ap'l 1, 1865.	
6	1,419		3,895		1,292		6,606
5	1,647		8,507		25,462	793	36,409
4½			2,721		13,557		16,278
4	1,952		5,498		6,541		13,991
3	15,748	453	4,159	1,420	1,613		23,393
2½	22,289	4,767	2,284				29,340
2¼	6,359						6,359
2	20,258	4,658	38,907	3,372	35,007	6,462	108,663
1	68,781	1,034	27,177	1,547	26,620	516	125,675
	138,453	10,912	93,148	6,339	110,092	7,770	366,714
Totals,	149,365		99,487		117,862	69 ²³⁹⁴ ₅₂₈₀	miles.

CATCH BASIN AND MAN HOLES.

Built from April 1, 1864, to April 1, 1865.				Previously Built.	Total.	Average Cost 1864.
	South Dis.	West Dis.	North Dis.			
Catch Basins,	62	79	48	1496	1684	\$54.38
Man Holes,--	76	51	56	2405	2588	

There remain unexecuted contracts which are now being completed for the following sewers, viz.: in the South District, 450 feet of 3 feet sewer, and 1800 feet of 2 feet sewer; and in the West District, 280 feet of 4½ feet sewer, and 4425 feet of 2 feet sewer. The following table gives a resume of the construction and repairs for the year in detail:—

RETURN OF SEWERS BUILT AND REPAIRS OF SEWERS, FOR THE YEAR
ENDING APRIL 1, 1865.

LOCALITY.	CONSTRUCTION.						REPAIRS.				
	5 Feet.	3 Feet.	2½ Feet.	2 Feet.	1 Foot.	C. Basins	of Sewers Lin. feet.	of C Basins	M's & Bas. alt. to grade	Covers rep. and renew'd	
SOUTH DISTRICT.											
✓ Indiana av., from 19th to 16th	Ft.	Ft.	Ft.	Ft.	Ft.	No.		No.			
✓ Wabash av., from 22d to 19th				1,262							
✓ Wabash av., from 19th to 16th				1,270							
✓ Michigan av., from 19th to 16th				1,220							
✓ Michigan av., from 22d to 19th				1,429							
✓ Michigan av., from 22d to 23d				633							
✓ State st., from 22d to 19th				1,318							
✓ 14th st., from Michigan to Wabash				487							
✓ 16th st., from Michigan to Wabash				419							
✓ 16th st., from Indiana av., eastward					50						
✓ Wabash av., north and south of 14th					984						
✓ 22d st., from the river to McGlashon		453									
Totals in South District		453	4,767	4,658	1,034	62	58	42	83	222	
WEST DISTRICT.											
✓ Sangamon st., from Adams to Madison				935							
✓ Rucker st., from Adams to Jackson				489							
✓ Green st., from Madison to Washington				521							
✓ Peoria st., from Adams to Monroe				471							
✓ May st., from Madison to Washington				482							
✓ Morgan from Madison to Washington				425							
✓ St. John's pl., from Fulton to Lake				444							
✓ Elizabeth st., from Fulton to Lake				451							
✓ May st., from Fulton to Lake				440							
✓ Maxwell st. from Canal to Jefferson	793										
✓ Jefferson st., from Maxwell to Mitchell				475							
✓ Halsted st., from 12th to DeKoven				653							
✓ St. John's pl., from Fulton to Carroll				337							
✓ Peck st., from Fulton to Carroll				338							
✓ Green from Washington to Randolph					431						
✓ St. John's pl., from Carroll to North					85						
Totals in West District	793			6,461	516	79		6	59	131	
NORTH DISTRICT.											
✓ Huron st., from Clark to LaSalle				434							
✓ Superior st., from Clark to LaSalle				434							
✓ Pearson st., from Market to Franklin				425							
✓ Huron st., from Market to Franklin				408							
✓ Superior st., from Market to Franklin				412							
✓ Pearson st., from Green Bay to Pine				504							
✓ White st., from Market to Townsend				755							
✓ Wolcott st., from Division to Schiller		1,420									
✓ Pearson st., from Wolcott westward					156						
✓ Huron st., from Pine to St. Clair					349						
✓ Huron st., from LaSalle to Wells					382						
✓ Superior st., from LaSalle to Wells					382						
✓ Wolcott st., from White to Whitney					275						
Totals North District	793	1,420		3,372	1,547	48	40	31	44	44	
GRAND TOTALS, 25,021 ft.=4 m ls. 3901ft.	793	1,873	4,767	14,491	3,097	189	9	79	186	397	
AVERAGE COST PER FEET...	6.33	4.92	3.29	2.81	1.85	54.38					

CLEANSING AND REPAIRS.

With the increased extent of the sewerage system, there has been an increase in the amount of work required for cleansing

and repairs, and the cost of this work has been greater than heretofore, from the higher wages prevailing.

It should be borne in mind that a large share of this expense, probably one half, is due to the fact that the greater part of our sewered streets are unpaved, and in consequence much earth is swept into the sewers through the catch basins during rain storms, which requires artificial removal, and, also, the manholes and catch basins being unprotected by pavements are exposed to injury from vehicles and frost. The following table shows the cleansing and repairs for the past year and the cost of the work:—

CLEANSING OF SEWERS AND CATCH BASINS, AND COST OF SAME.

METHODS OF CLEANSING.	South District		West District.		North District		Total Lin ft. clea'd	Rate of cost \$ 100 ft.
	Lin ft. clea'd	Cost.	Lin ft. clea'd	Cost.	Lin ft. clea'd	Cost.		
Flushing Sewers with Tank...	42,700	\$1262.00	.....	.....	35,800	\$983.07	78,500	\$ 2.86
Removing deposits from main with scrapers and barrows..	8,400	316.20	34,600	\$1067.41	20,400	616.00	63,400	3.15
Cleansing with chain machine	28,200	3234.00	2,600	198.00	.....	.....	30,800	11.14
Cleansed catch-basins.....	No. of 450	539.00	No. of 640	762.00	No. of 370	387.00	No. of 1,400	Each. 1.15
Totals of Cost.....		\$5351.00		\$2029.41		\$1986.07		\$9,364.68

COST OF REPAIRS.

There has been expended during the year for the repairs of sewers and catch basins, and for altering manholes to grade, as follows: in the South District, \$1432.39; in the West District, \$1,216.09; and in the North District, \$683.67; total, \$3,332.15.

For renewals and repairs of covers, for man holes and catch basins, there has been expended in the South District, \$468.00; in the West District, \$479.00; and in the North District, 107.-00; total, \$1,072.00; making a total for all repairs of \$4,404.-15.

HOUSE DRAINS.

The following tabular statement, shows the number of house drains which have been connected with the public sewers during the past year, all of which, together with a very large number of extensions and alterations of old drains have been inspected, surveyed and platted upon the office maps:—

PERMITS FOR PRIVATE DRAINS ISSUED FROM APRIL 1, 1865.

PART OF THE CITY.	6 inch Drain.	9 inch.	12 inch.	Total in 1864-65	Total previ- ously laid.	Total to Ap'l 1, 1865.
South District,---	274	25	2	299	-----	-----
West District, ---	111	7	1	120	-----	-----
North District,---	86	6		93	-----	-----
Totals, -----	471	38	3	512	3,338	3,850

The following table is deduced from a series of tri-daily observation of the elevation of the water of the lake, giving the highest, lowest, and average height for each month; and also the yearly maxima, minima, and means; extending from January, 1855 to April, 1865. I am indebted to Lieut.-Col. J. D. Graham, U.S. Top. Engineer, for the observations for the year 1855, which have been reduced from his plane of observations to the city datum. The observations subsequent to that year were continued by the late Sewerage Commissioners and by the Board of Public Works, and are thought to be of sufficient value to be preserved in this report, as far as they have been kept up, and that they should be continued in future years.

Which is respectfully submitted.

WILLIAM H. CLARKE,

Prin. Assistant Engineer.

TABLE SHOWING THE ELEVATION OF LAKE MICHIGAN, ABOVE THE CHICAGO DATUM,
FROM JANUARY, 1855, TO APRIL, 1865.

	JAN.			FEB.			MARCH.			APRIL.			MAY.			JUNE.			JULY.			AUG.			SEP.			OCT.			NOV.			DEC.			YEARLY.		
	Max.	Min.	Mean.	Max.	Min.	Mean.	Max.	Min.	Mean.	Max.	Min.	Mean.	Max.	Min.	Mean.	Max.	Min.	Mean.	Max.	Min.	Mean.	Max.	Min.	Mean.	Max.	Min.	Mean.	Max.	Min.	Mean.	Max.	Min.	Mean.	Max.	Min.	Mean.			
1855	1.35	0.15	0.76	...	...	...	1.27	0.50	0.80	1.25	0.35	0.80	2.10	0.85	1.55	2.80	0.55	1.78	2.35	1.15	1.87	1.35	1.55	1.98	3.45	1.65	2.07	2.75	1.40	1.94	3.15	1.30	1.74	2.15	1.40	1.84	3.45	0.15	1.56
1856	2.44	1.53	1.90	1.95	1.11	1.41	1.85	0.80	1.43	2.35	1.20	1.56	3.05	1.00	1.99	2.35	1.55	1.92	2.30	1.35	1.99	2.45	1.53	1.80	2.25	0.55	1.68	2.93	0.53	1.49	2.36	0.42	1.43	2.06	0.59	1.20	3.05	0.42	1.60
1857	1.93	0.60	1.00	...	...	...	...	...	...	2.95	1.35	1.87	2.95	1.85	2.22	3.25	1.65	2.52	3.35	2.61	2.95	3.60	2.51	3.14	3.60	2.60	2.99	4.35	2.75	3.06	3.00	1.65	2.25	3.00	1.30	2.29	4.35	0.60	2.42
1858	3.00	1.55	2.22	2.57	1.40	1.93	2.20	1.33	1.85	3.45	2.20	2.37	3.55	2.42	2.85	3.75	2.76	3.27	4.30	3.11	3.66	4.58	3.55	3.92	4.69	2.25	3.22	3.05	2.46	3.07	4.30	2.33	3.86	3.48	1.95	2.76	4.69	1.33	2.90
1859	3.48	1.31	2.27	2.66	2.18	2.40	2.78	2.18	2.46	4.28	1.90	3.10	4.15	2.40	3.25	4.45	2.25	3.25	4.35	3.40	3.90	3.80	3.30	3.00	4.20	2.50	3.36	4.00	2.60	3.03	3.50	2.30	2.53	3.30	2.10	2.60	4.45	1.31	2.98
1860	2.07	1.30	2.28	3.53	1.50	2.45	3.50	2.10	2.53	3.00	2.20	2.68	3.07	2.46	2.83	3.13	2.67	2.80	3.20	2.60	2.93	3.00	2.45	2.85	3.45	2.46	2.60	2.78	2.30	2.54	3.30	1.80	2.22	2.20	1.30	1.55	3.53	1.30	2.54
1861	2.20	0.90	1.73	2.53	1.20	1.74	2.43	0.95	1.93	2.58	1.86	2.34	3.25	2.38	2.77	3.20	2.70	3.00	3.50	2.60	3.10	4.40	3.10	3.36	3.50	2.80	3.07	3.40	2.20	2.85	3.40	2.10	2.65	2.70	1.70	2.20	4.40	0.90	2.56
1862	2.90	1.70	2.12	2.60	1.60	2.02	3.30	1.60	2.30	3.10	2.10	2.50	3.20	2.30	2.70	3.20	2.60	2.90	3.10	2.50	2.80	3.10	2.50	2.70	3.20	2.20	2.77	3.20	2.00	2.70	3.30	1.40	2.50	2.50	1.20	2.00	3.30	1.20	2.50
1863	3.00	1.40	2.10	2.60	1.00	1.90	3.00	1.00	2.05	2.50	0.80	2.10	3.00	2.00	2.37	2.80	1.90	2.40	3.10	1.90	2.40	3.30	1.60	2.20	3.10	1.50	2.20	2.50	1.20	1.90	2.40	0.70	1.67	2.90	1.00	1.70	3.30	0.70	2.10
1864	2.50	0.30	1.50	2.00	0.50	1.34	2.20	0.90	1.50	2.50	1.40	1.85	2.80	1.70	2.05	2.40	1.70	2.00	2.60	1.60	1.95	2.40	1.40	1.75	2.30	0.80	1.40	1.80	0.80	1.13	1.90	-80	0.84	1.70	0.00	0.70	2.80	-80	1.57
1865	1.80	-40	0.40	1.40	0.30	0.66	2.30	0.10	1.00	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

CONDITION OF THE RIVER.

As this received so much attention last year, especially by the commission of Engineers, whose report was made to the City Council, on the 6th of March last, it is here thought sufficient on this subject to refer to that report.

THE HARBOR ENTRANCE.

In consequence of complaints of vessels getting aground in the south channel, a survey was made of that pass into the harbor, and it was found that there was scarcely 12 feet of water in the deepest places on some sections of the channel at ordinary stages of the Lake, which depth was always liable to be reduced by strong southerly winds to 11 feet, or less. Besides this there seemed to be a downward tendency in the general level of the lake. To avoid serious injury to the commercial interests of the city, from a want of sufficient depth in the south channel, dredging across the bar at the light-house had been commenced; but without some structure to preserve the newly dredged channel from filling up again, it was feared that no permanent relief could be obtained in this way.

Five different modes of preserving the entrance to the harbor in such a state as to admit vessels of the largest class navigating the lakes were presented, viz.:—

1st. Dredging.

2d. Extending the south pier, and depending upon the river current to scour out and maintain a channel.

3d. Uniting with the Chicago Dock and Canal Company in extending a pier sufficiently far out, north of the north pier, to prevent accretions in the channel.

4th. Constructing a curved pier out in the lake, of such a form and at such a distance from the Light House, as to cause a sufficient current during the prevalence of northerly winds to scour away the bar that would otherwise obstruct the entrance to the harbor just opposite the opening left.

5th. Extending the north pier.

The first plan would probably have been the cheapest, could there have been any certainty as to a sufficient duration of favorable weather, but this uncertainty was too great to allow the plan to be adopted; for the possibility of having the harbor closed for but small portion of the season of navigation, could not be thought of.

The second plan was not adopted because of the doubt of its effecting the object, at least to a sufficient extent.

The third plan would probably have been effective, at least in protecting the north side of the entrance to the harbor, and could have been carried out at considerably less cost to the city than any other. Had negotiations between the parties interested commenced earlier, a mutually satisfactory arrangement might have been made; but as no time was to be lost, owing to the lateness of the season, and as there seemed to be some objection to uniting with any others in such a work, it was thought best to proceed with it alone. It should be mentioned here too, that by this plan the city could not have hoped to receive back from the National Government, the expenditures it might make on account of the pier.

The fourth plan was not adopted because of its greater estimated cost than the others, and because of some doubt as to the dredging that might be required annually after its completion. It should be said, however, that this plan is similar in principle to those adopted by the Romans for some of the Mediterranean harbors of refuge, as mentioned by Vauban in his memoir on the harbor of Cette, dated August 13, 1681.

The fifth plan was decided upon after much discussion and investigation, because it appeared to be the cheapest that would afford effectual relief for the present, and that would be free from the objections brought against a joint arrangement between the city and private individuals for building a pier several hundred feet north of the north pier.

The plan decided upon was to construct a pier of wood and

stone, of the usual form adopted by the government for Lake Harbors, 400 feet long, 24 feet wide, and 21 feet high, or 6 feet above ordinary water in the Lake, sufficient dredging to be done on the bar to sink the cribs to this depth.

After the plan had been decided upon and the Board had received proposals for doing the work, it was discovered, through the presence of Col. T. J. Cram, U. S. Engineer, and Superintendent of Lake Harbors, that the city had no power to construct any works at the entrance of the harbor without the consent of the national government, and that all plans to be adopted, must first be approved by the War Department. Col. Cram lost no time in examining the plans adopted by the Board, and suggesting such modifications as he thought advisable. The principal modification was that in the direction of the pier extension which the Board had concluded should be east and west; but Col. Cram thought it should be parallel with the most northerly inclined portion of the old pier. He recommended too the early extension of the pier 100 feet further than the Board proposed, and the ultimate extension of 500 feet further, making a total length of new pier of 1,000 feet. Col. Cram's reason's for his recommendations are so forcibly stated in his report to the Government, containing his views on a subject so important to the public, that it is thought best to give that report entire here; a copy of it having been kindly furnished by him for this purpose.

REPORT AND RECOMMENDATION IN REFERENCE TO

CHICAGO HARBOR.

BY COL. T. J. CRAM, A.D.C., LT.-COL. U. S. CORPS ENGINEERS,
SUPERINTENDENT LAKE HARBORS.

MADE IN CONFORMITY WITH INSTRUCTIONS FROM THE ENGINEER BUREAU,
AUGUST 2D, 1864. INSPECTION AUGUST 22D, 1864.

I. A full history of the U. S. operations at this harbor from the time the artificial pier works were commenced and a full description of the formation, changes, dredging of bars, consequent upon those pier works; and the filling up of the newly

dredged channels, consequent upon the littoral current, if written, would fill a volume with very interesting and instructive matter to the engineer.

It is no purpose of mine however, to touch in this report upon those subjects any farther than is absolutely necessary to explain the present condition of the harbor, and to enable us to suggest what may be done with advantage to preserve and secure a channel sufficiently wide and deep for the passage of vessels carrying on the existing commerce in its connection with this highly important national harbor.

Drawing A. herewith submitted shows the bar across the direct entrance from the lake, such as developed by the soundings taken August 13th and 15th, 1864, under my superintendency.* Pass a horizontal plane through the 12 feet curve, that is at a depth of 12 feet below the *present* surface of the water, and we have above this plane a bar 4800 feet in length and of an average width of 900 feet. The width of this bar directly opposite and across the direct entrance from the lake is 810 feet. Passing our horizontal plane however at a depth of 15 feet we have a greater length and width of bar, as the drawing will show. In order to secure a channel sufficiently wide and to a depth of 13 feet for coming years, we shall have to contend with the bar that lies on the horizontal plane passed through the 15 feet curve, because the general oscillation of the lake is now on the descent and will continue to fall, so that its surface will be two feet lower than at the present time, when according to former experience the general oscillation will be in the ascent. The surface of the lake at Chicago is reported to me by the City Engineer, at the present time, two feet higher than in 1847. The stage of 1847 has been fixed upon by the Board of Public Works, as the plane of reference for the city drainage, water works, &c.

In March, 1851, the longitudinal axis of the bar, lying on the plane of the 12 feet curve, bore from a point near the head

* The surveys were made under the immediate supervision of E. S. Cheshbrough, Esq., City Engineer.



dredged channels, consequent upon the littoral current, if written, would fill a volume with very interesting and instructive matter to the engineer.

It is no purpose of mine however, to touch in this report upon those subjects any farther than is absolutely necessary to explain the present condition of the harbor, and to enable us to suggest what may be done with advantage to preserve and secure a channel sufficiently wide and deep for the passage of vessels carrying on the existing commerce in its connection with this highly important national harbor.

Drawing A. herewith submitted shows the bar across the direct entrance from the lake, such as developed by the soundings taken August 13th and 15th, 1864, under my superintendency.* Pass a horizontal plane through the 12 feet curve, that is at a depth of 12 feet below the *present* surface of the water, and we have above this plane a bar 4800 feet in length and of an average width of 900 feet. The width of this bar directly opposite and across the direct entrance from the lake is 810 feet. Passing our horizontal plane however at a depth of 15 feet we have a greater length and width of bar, as the drawing will show. In order to secure a channel sufficiently wide and to a depth of 13 feet for coming years, we shall have to contend with the bar that lies on the horizontal plane passed through the 15 feet curve, because the general oscillation of the lake is now on the descent and will continue to fall, so that its surface will be two feet lower than at the present time, when according to former experience the general oscillation will be in the ascent. The surface of the lake at Chicago is reported to me by the City Engineer, at the present time, two feet higher than in 1847. The stage of 1847 has been fixed upon by the Board of Public Works, as the plane of reference for the city drainage, water works, &c.

In March, 1851, the longitudinal axis of the bar, lying on the plane of the 12 feet curve, bore from a point near the head

* The surveys were made under the immediate supervision of E. S. Cheshbrough, Esq., City Engineer.

MAP OF CHICAGO HARBOR.

To accompany my Report upon that Harbor
to the Engineer-Department - August 1864

Col. T. J. CRAM, U.S. Corps Engineers
Superintendent Lake Harbors

NOTE 1.

The north line indicating the Shore Line for successive past periods we see the law of formation. The new Shore line is to the North of the North Pier. The new Shore in progress of the extension of that Pier has not yet reached its final position, and is liable to be moved more and more to a position at right angles with the North East line of direction of the prevailing winds. Now this being the case as shown by the successive surveys it is a case to see that the new pier is producing the littoral current in this manner from period to period, and finally as we should extend the pier the new Shore by the accretion continuing, would so form as to become at right angles to the North East, and then it would be zero, and the sand would cease to be carried past the end of the Pier, to form a bar across the entrance of the Harbor.

See what is written in the Report on this subject

NOTE 2.

The surface of the Water over the bar at present is 2 feet higher than the Water of 1857 as then fixed by the City as the plane of reference for the Board of Public Works, in all their operations.

NOTE 3.

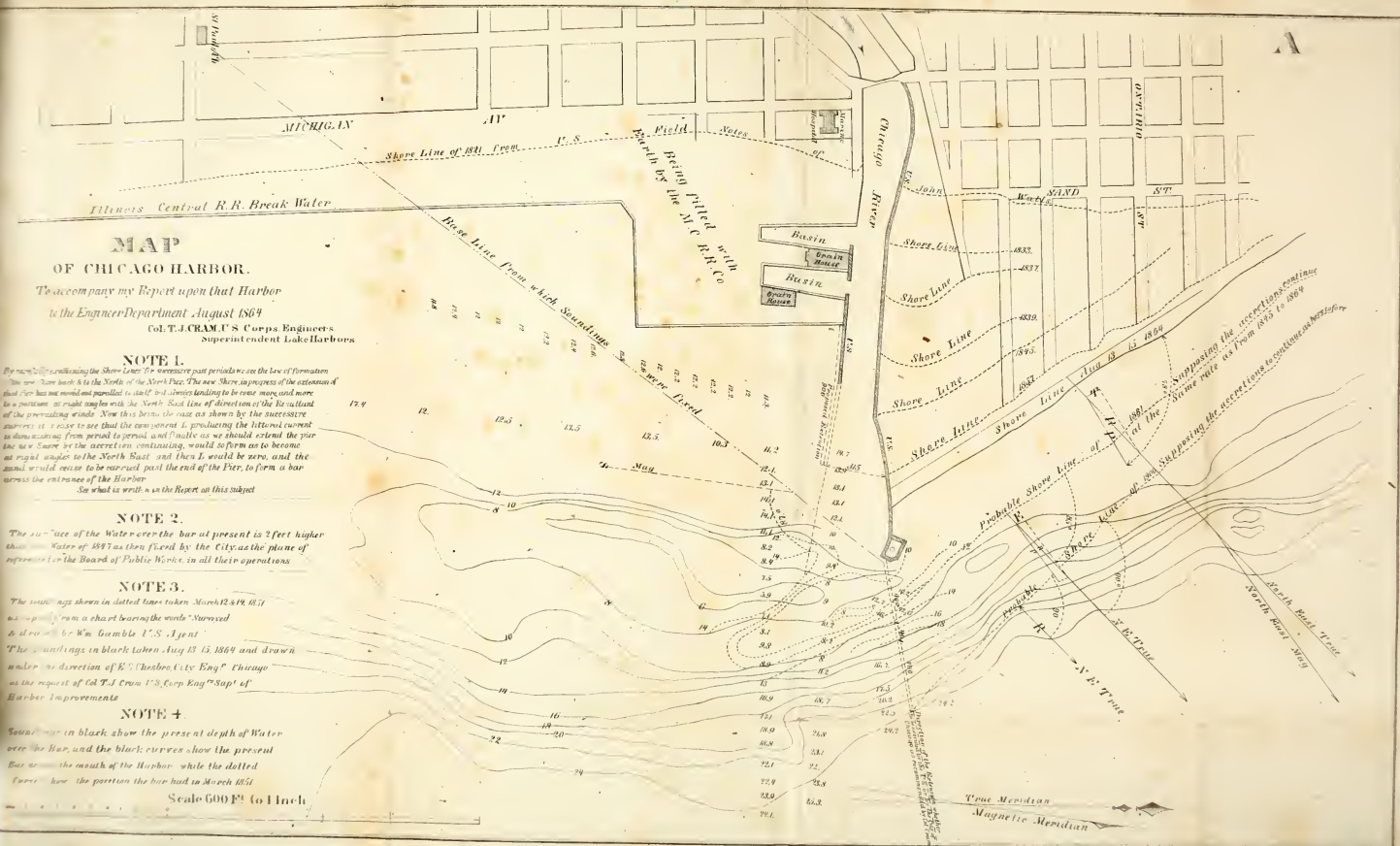
The soundings shown in dotted lines taken March 12 & 19 1857 as reported from a chart bearing the words "Surveyed & drawn by Wm. Gamble U.S. Agent"

The soundings in black taken Aug 13 1854 and drawn under the direction of E. C. Chesley City Eng^r Chicago as the request of Col. T. J. Cram U.S. Corp Eng^r Sup^r of Harbor Improvements

NOTE 4.

Soundings in black show the present depth of Water over the Bar, and the black curves show the present Bar across the mouth of the Harbor, while the dotted curves show the position the bar had in March 1857

Scale 600 Feet to 1 Inch



ing 11
te a

he u

of the north pier 19° east of true meridian, and it was 1200 feet long; and the maximum width of the bar was 420 feet and the shoalest water on the bar was 8 feet.

In April, 1857, according to the survey then made under Col. J. D. Graham's superintendency, the longitudinal axis bore 10° east of that meridian and it was 2000 feet long, and the greatest width of the bar was 700 feet; while at the present time (August 15th, 1864) the longitudinal axis bears 15° west of that meridian, and its maximum width is 1080 feet.

Hence in the period of $7\frac{1}{3}$ years the bar has grown in length 2800 feet, and in width 380 feet. The shoalest water on top of the bar was then $9\frac{1}{2}$ feet, while now it is only 6 feet. The growth of the bar vertically upwards being $3\frac{1}{2}$ feet in the same period, and during the same period the bar has swung around through an angle of 25° towards the Chicago shore *south of the harbor*.

The north pier has not been extended or changed since these effects have been going on, while the causes producing these changes have been constantly operating with their full effect.

Here then we have two periods—one of 6 and the other of $7\frac{1}{3}$ years, affording us the following rates of changes in this bar annually:—

FIRST PERIOD.

Annual elongation of the bar,-----	134 feet.
“ widening,-----	47 “
“ growth in vertical height,-----	—0.25 “
“ swinging of the bar towards south shore,--	$1\frac{1}{2}^{\circ}$

SECOND PERIOD.

Annual elongation of the bar, -----	382 feet.
“ widening,-----	52 “
“ growth in vertical height,-----	0.47 “
“ swinging of the bar towards south shore,--	$3.^{\circ} 25'$

These important changes are thus seen on comparing the annual rates for the two periods working to the disadvantage of the harbor in an increasing annual ratio.

In the season of 1854 it seems that by dredging, a channel between the head of the bar and the head of the north pier, was obtained for a vessel drawing 12 feet to safely run in and out in *moderate weather*—see drawing B; with a channel so contracted and bordered too with moveable sand, it is at once seen that under a stiff gale this would be no harbor of refuge, without great risk of stranding, especially for a vessel drawing more than 10 feet. I am informed by the Boards of Public Works and of Trade of Chicago, that this dredged channel filled up during the next succeeding winter, and in the spring of 1858 vessels drawing 12 feet and even of less draught began to experience difficulty in entering directly, and have since been obliged to arrive and depart by a track seen on A. around the south end of the bar and along between it and the Central R. R. Co.'s breakwater. And the shoaling of the water on the bar, the elongation, widening, and swinging of the bar to the west have gone on so rapidly—as explained on p. 65—that serious difficulties have been met even in this roundabout track by vessels in coming up under N. E. winds; and the most serious apprehensions are now entertained that unless something be speedily done, the harbor will be rendered null for all national purposes. And well may this apprehension exist, for, by all the effects explained on p. 65 combined, it is readily computed that if the same causes producing these effects continue for three years longer, even the present passage between the bar and the R. R. breakwater will be effectually blocked to any craft drawing over 5 feet water.

II. *Causes producing the bar, making it to grow and swing towards the west shore, around a point near the head of the north pier, as a hinge.*

The lake shore for miles to the north of the harbor is sand, easily moved when stirred up.

The prevailing winds affecting the harbor are from E. and N. E., and if their strengths and directions be accurately measured for each day in the year, the resultant of all these forces will be found to be very great, and in direction nearly from due N. E.,

striking the shore as it now trends (in 1864) in an angle of 78° .

Let the line R. on drawing A. represent in magnitude and direction this resultant; decompose R. into its components P. L. respectively, perpendicularly, and parallel to the present direction of the shore, and we shall find $P=0.98 \times R$ and $L=0.208 \times R$.

Now the force P. is expended in beating the shore and stirring up the sand; and the force L. produces the littoral current running southerly on that shore; and this littoral current carries portions of the sand along, filling up back of the pier, until the accretion of land there reaches out to the extremity of the pier; and then the sand is carried by this current past the pier and across the harbor and down southerly, as long as the wind blows. The swinging of the bar towards the west shore is the result of the S. E. winds which have their full effects sometimes, though with nothing like the force of E. and N. E. winds.

From this brief analysis, it is evident that if the north pier could always be kept extending in advance of the accretion north of it, there would be no serious difficulty in preserving a good channel at the mouth. Heretofore, from the commencement of these piers in 1833, to the present limit of extension, the work has been carried on in a spasmodic manner—as appropriations could be had.

III. *Measure and progress of the accretion north of the pier.*

Fortunately we have for the measure of the progress of the accretion good data. The red* dotted shore line of 1821, is the first record I can find of a shore line; the black dotted lines terminated at the back of the pier, are mapped from good surveys made in the years marked—and we may record the data in the following tabular form:—

* Black on the printed plan.

PERIOD.	No. of Years.	Progress of accretion along back of the Pier.	Rate of motion of shore line at pier Eastward per year.
1821 to 1833,-----	12 Years.	380 feet.	31.7 feet.
1833 " 1837,-----	4 "	320 "	80.0 "
1837 " 1839,-----	2 "	400 "	200.0 "
1839 " 1845,-----	6 "	350 "	30.8 "
1845 " 1857,-----	12 "	340 "	28.3 "
1857 " 1864,-----	7 "	250 "	35.7 "

These measures are taken from the chart of the surveys of 1857, reported by Col. Graham, and from my survey of 1839.

As the first period involves some doubt in respect to the red dotted line on drawing A., and as no piercing was done prior to 1833, I will only use the data pertaining to the five subsequent periods since the piercing was commenced.

It is seen that the direction which the pier had between the shore lines of 1845 and 1857, is the direction attending the least annual accretion, while the direction subsequently given to the pier as its extension progressed, is attended with a somewhat greater annual accretion, and the greatest annual accretion is that which occurred when the pier had the direction running a little south of east, before my superintendency commenced in April, 1839. By reference to my report on this harbor, Sept. 1st, 1839, printed [Senate Doc. 26th Cong. 1st Sess.] I find that the pier has since 1843 (when my superintendency ceased,) been carried out about 600 feet further in the direction and shape as far as it has been extended according to the plan recommended in that report. I am happy to find that time and experience now justify that recommendation.

In any hereafter extension, therefore, would it not be well, on account of hoping for the least annual accretion that will form back of the pier, to continue to follow the general direction then recommended? It would certainly seem to be wise to avail ourselves of the practical results of so long a term of engineering experience.

IV. *What the City of Chicago has been and now is doing, in the well grounded apprehension of the speedy closing of the passage around the south end of the bar.*

See drawing C. The firm of Fox & Howard, of Chicago, under contract with the city, commenced dredging, with a view to obtain a direct wide channel through the head of the bar, July 24th, and ended October 21st, 1863, removing in that interval 44,524 cubic yards, with four steam dredges, six sand scows, and one steam tug, working all the time the weather permitted. They again commenced with same force June 3d, 1864, and have continued to the present, having in the interim to 15th August, removed 44,000 cubic yards, and have just succeeded in opening a narrow channel, admitting propellers of 12 to 12½ feet draft. This channel, however, is, as yet, so narrow that on the 17th inst., while I was there, four vessels stranded on the bar in attempting to run in, several others entered safely, others again anchored in the offing, wind N. E. and strong for 12 hours previous. This liability of stranding will exist unless a breadth north and south of 300 or 400 feet be dredged sufficient to allow vessels to wear in coming in, and to a depth of 12 feet at least throughout.

On commencing operations this summer with the dredge, it was found that almost all they had gained by their last years work had been filled up again by the action of the littoral current, due to the component force L., during the winter, just as it was in the winter next succeeding the channel left by dredging in 1854.

The space from which these contractors are to remove the sand, at the expense of the city, at 50 cents per cubic yard, is embraced between the red tinted* borders on drawing C; and the depth is to be 15 feet throughout, so as to have 13 feet when the lake falls to its low stage. The sand removed is towed in scows with the steam tug and deposited to the south of the bar in deep water. The measurement of the amount removed is made as it rests in the scow's hoppers, by an Inspector appointed by the city.

Now, the great practical difficulties in maintaining a channel in this manner are these: the dredge cannot be worked in the

* Embraced between lines B C and E D on printed plan.

season except from about the 1st of June to the 20th of October—and even in this interval there are many days when it cannot be worked, in consequence of the roughness of the lake. The borders of the dredged channel are but slopes of sand, which on the agitation of the water easily moves, seeking the lower places, and thus partially if not wholly filling up the newly dredged cuts, thus necessitating a redredging. Again, during the following eight months, from October to June 1st, the whole channel dredged in the preceding season will be partially, if not wholly, filled, and when navigation opens the next spring no adequate channel there exists, nor can the dredges be put to work on account of spring gales, to reproduce one until long after it is much needed, and the season of active commerce has considerably advanced into summer.

The sum of \$44,000 has been expended by the city in dredging under these difficulties, since July 24th, 1863, and only an inadequate channel is yet obtained, nor can there be one maintained in this manner, as long as the north pier be not *extended*, and be kept extended beyond the bar to cut off the effect of the littoral current caused by the force L. (explained on p. 67) and thus preserve the channel as it may be dredged out afterwards.

V. Proposed plan best to be pursued.

For reasons already given and those which will follow, all resting on facts derived from an experience of over 30 years, and by a proper use of the practical results produced by the pier work already constructed at this harbor, in connection with the results of the known laws of hydrodynamics, we certainly ought to be prepared to suggest a course, which if followed out will accomplish the end of maintaining a good adequate channel for this harbor.

Let the city extend the north pier 400 feet, which can yet possibly be done under the energy of her enterprising contractors (Fox & Howard) the present season, as long as the weather will permit, and the coming winter's winds will not probably fill the channel that will be left when this season's dredg-

ing closes. Early the next season as possible, extend the pier 110 feet more, making a total extension of 510 feet, and we shall have it out to the curve of the 12 feet water. See drawing A. Then be sure to dredge the channel if needs be next summer to a sufficient width and depth, and it, under the protection of the pier extension, will be secured, until the accretion on the north of the pier will again reach the end of the pier. When will this occur? Let us see. Take the last two periods in the table (p. 68) and combine them into one from 1845 to 1864—19 years; in this interval the shore line has advanced eastwardly, just back of the pier, 590 feet, which is at the rate of 31 feet per year. Now, if we go north to Ontario street, I find that there this shore line, in the same period, has advanced easterly only 468 feet, or at the rate of 24.6 feet per year. Now, the component force L. will continue to act (though with a less and less effect than at present, as will be seen.) We can readily construct the probable shore line as it would be in 1881, when the sand under the action of L. would again begin to pass the end of the 510 feet of the proposed extension, to again form a bar across the mouth of the harbor. This shore line has been carefully put in red on drawing A.

It is seen by the eastern motion of the shore line that it is constantly assuming positions more and more approaching at right angles to the direction (N. E.) of the prevailing winds. The component force L., therefore, becomes smaller and smaller, until, when the shore line by a still farther extension of the north pier than now proposed to be immediately done, shall become at right angles with the direction of the prevailing winds, L. will become absolutely zero.

For example, the present time (1864) $L=0.208 \times R$; and 17 years hence L. will not be as great as $0.208 \times R$; and before the year 1900, L. will become zero. These conclusions, based upon facts derived from experience, are certainly favorable conditions for the future of the harbor at Chicago; and they encourage the hope that by immediately extending the north pier 400 feet and adding 110 feet next season, the bar at the extremity

will not again begin to form, short of the year 1881, by the action of L; and that period will be as much beyond that as L. diminishes from its present strength in producing the littoral current. Therefore, beyond the extension now recommended, the north pier should be carried out as rapidly as possible to obtain means to do it, to the 24 feet curve, seen on drawing A. This would add 490 feet to the work after next year. The pier would then be beyond where L. becomes zero, and after which the drifting sand by the littoral current would move northward under the prevailing winds. The south pier should also be carried out, as means can be obtained, so as to be less in extent than the north by 1600 feet, when the north pier shall have been extended to the 24 feet curve. This would make the south pier to reach to about 900 feet beyond the N. E. angle of the I. C. R. R. Co.'s breakwater.

The direction which I think the proposed extension of the north pier should have is $71\frac{1}{4}^{\circ}$ east of the magnetic meridian, and the direction of the south pier extension should be so given as to have a width of water for the mouth of 350 to 400 feet between the piers. This would cause the extension of the south pier to bear about S. 87° E. mag. meridian. Besides the dredging contracted by the city to be done this season, the city authorities, while I was in Chicago, passed an ordinance, appropriating \$75,000 (dollars), for extending the north pier 400 feet this season, and Fox & Howard, well prepared for doing such work, have put in a bid to do this for \$62,200, upon such plan and specifications as will meet the approbation of the U. S. Engineer Department, all to be substantially put in and filled with stone, and decked over this season if the weather permit. And the Board of Public Works are now only waiting for me to give them the direction for the extension; also to obtain permission of the Government to allow the extension to be commenced immediately by the city. I have carefully examined the plans and specifications of the cribs, and should approve of them.

VI. *What shall be done with the \$25,000 allotted out of the general appropriation by Congress, this year, for the "Repairs and Security of this Harbor."*

I recommend this. Let the city proceed to dredge and put in the 400 feet of extension, and after that the money under my control could, under the law, be expended for preserving the channel thus produced, by hiring Messrs. Fox & Howard to dredge next season, or should it turn out that no dredging would be required, then to expend the government \$25,000 in making the 110 feet additional that would be required to make up the whole 510 feet extension of the north pier, and thus to preserve the channel that will have been made by that time by Fox & Howard, at the expense of the city. This firm has all the required machinery ready for the work.

The piers as they exist need but little or no repairs, which ought to be made by the U. S.—and without a previous extension of the north pier—in my estimation the money will go but a very short way towards securing a channel; besides we could not now dredge there if it were desirable, as Fox & Howard are now working there under a contract for the city. To commence to build machinery for dredging or for putting in pier work, would be unwise, as the sum allotted out of the appropriation would only begin, as it were, to pay for the machinery.

In conclusion, I have to express my thanks for the assistance I have received in obtaining the soundings and other data, from E. S. Chesbrough, Esq., City Engineer, of Chicago, and his assistants.

I have the honor to remain,

Very respectfully, your obdt. servant,

T. J. CRAM, Col. A.D.C.,

Lt.-Col. Corps Engineers.

To Brig.-Gen. RICHARD DELAFIELD,
Chief Engineer.

According to the foregoing plan, and in conformity with the suggestions of Col. Cram, the pier extension was commenced last year with the hope of completing it before winter; but owing to unfavorable weather, the contractors Messrs. Fox & Howard and O. B. Green & Co., succeeded in putting down only about 80 feet before the close of the working season. Much anxiety

was felt, on account of the possibility of the newly dredged but still too narrow channel being filled up so much during the winter as to destroy navigation, at least for vessels of heavy draft. As soon as possible this spring, soundings were taken, and the channel though partially obstructed, was found still sufficient, if great care was used.

August 25.—Since the first of April, the north pier has been extended to its full length, and most of the way to its full height. It was thought best not to finish up the outer end to the full height immediately, but to leave it for a time about even with the surface of the lake, to be settled by the action of storms, and then complete it with better prospects of retaining its outlines unchanged. As was expected the storms did affect the outer end considerably, causing the end of one crib to lean southward about three feet.

The cost of the pier extension has been materially increased by the increased amount of dredging, caused by the change in direction from what was originally proposed; but this change undoubtedly makes the entrance to the harbor easier for vessels coming from the north.

The dredging at the entrance of the harbor, was resumed by the contractors, Messrs. Fox & Howard, as soon as the season would permit. It has exceeded the amount originally estimated, 70,000 cubic yards, by about 50,000 cubic yards. This was owing partly to the partial filling up of the channel dredged before the extension of the north pier, partly to the impossibility of not getting deeper than 14 feet, in some places in order to secure that depth generally, and partly owing to dredging over a somewhat larger area than was at first intended.

Some points still exist in the channel where the soundings at ordinary water are less than 14 feet, but they were thought too unimportant to make it necessary to continue the work any longer the present season.

The city may now be congratulated upon having so good an entrance to her harbor; especially in view of the great deterio-

ration of the old or south channel, and the certainty, as shown so clearly in Col. Cram's report, of its speedy filling up by the bar now extending in that direction.

WASHINGTON STREET RIVER TUNNEL.

By direction of the Board, the plans prepared by the president, for a tunnel under the river on Washington street, were carefully examined, and submitted to the inspection of several distinguished engineers, either resident in this city or occasionally visiting it. As usual, there was some variety of opinion with regard to details; but in order to make use of the most important suggestions of those gentlemen, it was not necessary to change any essential feature of Mr. Gindele's last plan. The roof of the river portion of the tunnel was strengthened somewhat, to give greater security against the possible effect of dragging anchors or the sinking of a vessel over it.

Considerable labor was required in preparing the specifications and detailed plans, in which, Mr. Wm. Thomas, architect, of this city rendered valuable assistance.

Which is respectfully submitted,

E. S. CHESBROUGH,
City Engineer.

FINANCIAL STATEMENT.

Trial Balance, Ledger, Board of Public Works, March 31, 1865.

WATER DEPARTMENT.

	Dr.	Cr.
Water Works, (cost to date,)-----	\$1381,735.27	
Water Works Income, -----		\$1350,687.95
Water Loan Bonds, 6 per cent, -----		1030,000.00
Water Loan Bonds, 7 per cent, -----		278,000.00
Water Loan Interest, -----	599,714.90	
Water Expenses and Repairs, -----	475,139.74	
Discount on 6 per cent Water Loan Bonds, -----	57,133.08	
Water Funds in hands of City Treasurer, (am't due him,) -----		51,877.85
Water Works Stock, -----	15,198.25	
Water Works Coal, -----	8,773.18	
Water Works Service Cocks, -----	1,410.84	
Duncan, Sherman & Co., Coupon account, -----	38,340.00	
R. D. Wood & Co., Water Pipe account -----		4,597.08
Lake Tunnel, (expenditure to date,) -----	109,308.86	
Water Pipes, -----	24,026.52	
Pumping Works—Stock on hand, -----	4,382.24	
	<u>\$2715,162.88</u>	<u>\$2715,162.88</u>

WATER FUND.

STATEMENT of the Cash Receipts by the Board of Public Works
from April 1, 1864, to March 31, 1864, inclusive; and de-
tailed statement of the cost of the various operations con-
ducted by the Board during the same time:—

RECEIPTS.

Water Tax collected, -----	224,245.93	
Receipts for tapping pipes, -----	5,189.00	
" for shutting off and letting on water, ----	191.75	
" for sale of hydrants, material, coal, and labor, -----	1,928.71	
Discount on New York drafts bought, -----	104.02	
Labor done for Sewerage and City departments, --	1,423.27	
Proceeds of 7 per cent Bonds, -----	177,000.00	
Premium and interest on the same, -----	20,490.87	
Amount, erroneously charged this fund, refunded, -	32.00	
	<hr/>	
	\$430,605.55	
ADD—		
Balance in hands of City Treasurer, March 31, 1864,	6,531.72	
Amount due City Treasurer, March 31, 1865, -----	51,877.85	\$489,015.12

EXPENDITURES.

ADDITIONS TO WATER WORKS.

WABASH AVENUE MAIN.

		CASH PAYMENT.	TRUE COST.
24-inch pipe laid, -----	\$68,140.00		
Proving pipe, -----	300.00		
Hauling pipe, -----	1,078.00		
Lyman & Goggin, trenching and back- filling, -----	2,534.00		
Labor by city employees, -----	2,755.74		
Lead, -----	5,100.00		
Gasket and coal, -----	243.00	\$80,150.74	
	<hr/>		
ADD—			
Pipe used, previously paid for, -----	\$899.16		
One 24-inch stop cock, -----	200.00		
	<hr/>		
	\$1,099.16		\$81,249.90
		<hr/>	
Amounts carried forward, -----	-\$80,150.74		\$81,249.90

	CASH PAYMENT.	TRUE COST.
Amounts brought forward, -----	\$80,150.74	\$81,249.90

DISTRIBUTING PIPES LAID.

Cast iron pipe 4, 6, and 8-inch, -----	\$65,688.85	
Testing and laying pipe, -----	3,439.17	
Trenching and backfilling, -----	11,479.77	
Lead, -----	8,744.15	
Tapers, caps, sleeves, and branches, -----	2,017.65	
Hay, oats, and feed, -----	529.27	
Gasket and coal, -----	100.47	
Repairing tools, -----	19.26	
Horse shoeing, -----	27.78	
Repairing harness, -----	32.00	
Advertising for proposals for trenching, -----	21.75	
Miscellaneous, -----	90.62	92,190.74

ADD—

Pipes used, previously paid for, -----	\$9,273.68
New hydrants put in, -----	2,265.75
New stop-cocks put in, -----	1,001.01
Pipe layers' tools made at shop, -----	157.24
Tapping tools " " -----	53.32

\$12,751.00

DEDUCT—

Stop-cocks, sleeves, and caps for private parties, -----	113.24
--	--------

\$12,637.76

\$104,828.50
7.26

Expenses at Pump Works for new engine, -----

Total addition to cost of Water Works
not including Lake Tunnel, -----

\$172,341.48 \$186,085.66

LAKE TUNNEL.

Dull & Gowen, on account Lake Tunnel, outer crib, and extras, -----	\$97,670.22
Services of Engineer, -----	250.46
Services of draughtsmen, -----	449.55
Services of inspectors, -----	4,883.00
Labor, -----	395.67
Lumber, -----	804.21
Piles, including freight, -----	718.49
Office fixtures, (inspectors',) -----	58.15
E. W. Smith, consulting engineer, -----	400.00
Hardware, -----	53.85

Amounts carried forward, ----- \$105,683.60

	CASH PAYMENT.	TRUE COST.
Amounts brought forward,-----	\$105,683.60	
Brick, -----	17.50	
Repairing instruments,-----	192.75	
Chain, -----	36.91	
Horse keeping, -----	53.65	
Coal for inspectors' office, -----	42.90	
Miscellaneous, -----	154.05	\$106,181.36
ADD—		
Labor at Pump Works shop,-----	\$287.88	
DEDUCT—		
Services of inspector, -----	80.00	
	\$207.88	106,389.24
	\$106,181.36	\$106,389.24

WORKING EXPENSES AND REPAIRS.

EXPENSES AT PUMPING WORKS.

Salary of Engineer and two assistants, --	\$4,200.00	
Labor,-----	8,028.70	
Coal, 2604 tons, 357lbs, -----	27,760.85	
Coal for work shop, -----	322.53	
Oil and tallow,-----	752.59	
Gasket and packing,-----	108.03	
Hydrant castings,-----	4,868.39	
Brass Castings, -----	907.48	
Nuts, bar iron, and steel,-----	750.03	
One 6 ton scale,-----	272.18	
New piston, freight and truckage, -----	1,421.79	
Lead, -----	207.66	
Gas, \$137.09; hardware, \$92.64, -----	229.73	
Hay, oats, and feed, -----	136.13	
Horse shoeing,-----	20.75	
Waste, \$206.56; lumber, \$69.54,-----	276.10	
Carpenter work, windows and doors, ---	161.66	
Roofing, -----	21.21	
Mason work and plastering, -----	84.45	
Gas fittings, -----	16.25	
Overcharge on hydrants, -----	20.00	
Patent right on five hydrants, -----	25.00	
Paint, labor, and fixtures, -----	67.43	
Leather, -----	36.96	
Miscellaneous, -----	149.01	\$50,844.91
Amounts carried forward,-----		\$50,844.91

	CASH PAYMENT.	TRUE COST.
Amount brought forward,-----	\$50,844.91	
ADD—		
Coal used, previously paid for,-----	\$5,619.70	
Balance work shop account transferred,	3,170.43	
	<u>\$8,790.13</u>	
DEDUCT—		
Old iron sold,-----	\$562.76	
Hydrants and stop cocks sold,	381.00	
Wrenches for Fire Department,	12.00	
Labor and mate's for tunnel,	287.88	
“ “ for bridges		
and sewers,-----	771.42	
Hydrants, stop-cocks, & labor		
used for, and charged to,		
extension and repairs,---	8,804.59	
Labor at shop for sundries, --	322.55	
Stock on hand,-----	4,382.24	
Coal sold,-----	270.65	
	<u>15,795.09</u>	
	\$7,004.96	\$43,839.95

IMPROVEMENTS AT RESERVOIRS AND INLET.

West Reservoir fence,-----	\$2,478.45	
Dredging Basin,-----	2,632.50	
Sidewalk, North Reservoir,-----	69.00	
Keys for reservoirs, -----	2.00	
Hauling and filling, -----	122.25	5,304.20

ADD—		
Work at shop, -----	150.47	5,454.67

NEW ENGINE.

Traveling expenses of Commissioners and Engineer,--	264.90	264.90
---	--------	--------

REPAIRS OF PIPES, HYDRANTS, STOP-COCKS, AND MISCELLANEOUS
OPERATING EXPENSES.

Wages of caulkers and laborers on hy-			
drants, stop cocks, and operating			
pipe, -----	\$10,175.19		
Wheeling sand from basin, -----	1,295.62		
Salaries of hydrant inspectors and water			
police, -----	2,437.50		
Hay, feed, and oats, -----	459.29		
Carpenter work, lumber, and nails, -----	1,671.12		
	<u>\$16,038.72</u>	<u>\$56,414.01</u>	<u>\$49,559.52</u>
Amounts carried forward,-----			

		CASH PAYMENT.	TRUE COST.
Amounts brought forward,-----	\$16,038.72	\$56,414.01	\$49,559.52
Pipes, tapers, and castings, -----	293.40		
Tools and hardware,-----	70.75		
Horse shoeing,-----	35.77		
Repairs at North Reservoir,-----	61.76		
Repairing tools,-----	64.05		
Repairing wagon and harness, -----	229.33		
Repaving, -----	159.68		
Lead, -----	225.56		
Coal, -----	169.34		
Brick, \$165.00; cement, \$269.25,-----	434.25		
Drains for hydrants,-----	174.25		
Telegraph house,-----	27.00		
Powder and safety fuse for blasting ice at inlet,-----	10.25		
Express on bonds to New York & Boston,	40.00		
Miscellaneous, -----	264.67	\$18,298.78	
ADD—			
Hydrants used, -----	\$3,299.25		
Stop cocks used,-----	641.13		
Labor at shop,-----	387.81		
Watching Reservoirs,-----	163.70		
“ Inlet, -----	601.38		
“ Engine house, lot, & tunnel,	295.00		
Labor at pipe yard, -----	148.82		
	<u>\$5,537.09</u>		
DEDUCT—			
Received for shutting off and letting on water, -----	\$191.75		
Received for materials sold,--	170.86		
“ “ putting telegraph cable thro' main at State St.	122.00		
Broken pipe sold, -----	169.67		
Difference in stock, 1864 & 1865, -----	453.10		
Labor for private parties,-----	29.00	1,136.38	
	<u>\$4,400.71</u>		\$22,699.49
WATER METERS.			
24 meters, fittings, etc.,-----	\$3,293.06		
Repairs and setting, -----	1,114.24		
Lumber, -----	75.64		
Amounts carried forward,-----	\$4,482.94	\$74,712.79	\$72,259.01

		CASH PAYMENT.	TRUE COST.
Amounts brought forward,-----	\$4,482.94	\$74,712.79	\$72,259.01
Castings, -----	314.17		
Carpenter work, -----	81.14		
Labor, -----	83.05		
Nails, -----	27.25		
		4,988.55	
DEDUCT—			
Valuation of meters charged stock,---	\$2,851.50		
ADD—			
Depreciation on meters, -----	1,582.00		
	\$1,269.50		3,719.05

OFFICE EXPENSES AND SALARIES.

Salaries of Commissioners,-----	\$2,499.96		
Salary of Secretary, -----	800.00		
Salary of City Engineer,-----	1,200.00		
Salary of Assistant Engineer,-----	500.00		
Salary of City Superintendent,-----	600.00		
Salaries of clerks, -----	2,766.68		
Salaries of Water Assessors and Collectors,	6,049.92		
Salaries of draughtsmen, -----	1,924.19		
Labor, care of office, etc.,-----	961.64		
Blank books, stationery, binding, and printing, -----	1,424.04		
Advertising, (including bonds,) -----	722.19		
Newspapers, -----	16.78		
Scientific works, and City Directory,----	6.49		
Office furniture and repairs, -----	200.40		
Expenses keeping Assessor's horse, ----	55.21		
Revenue stamps,-----	206.55		
Coal, -----	17.25		
Painting and calcimining,-----	77.52		
Miscellaneous, -----	91.89	20,120.71	
DEDUCT—			
Expenses refunded, -----	\$32.00		
ADD—			
Advertising interest payments,-----	10.00		
	\$22.00		20,098.71
Total operating expenses,-----		\$99,822.05	\$96,076.77

CASH PAYMENT. TRUE COST.

I N T E R E S T .

Interest on Water Loan Bonds, July 1,		
1864, and January 1, 1865,-----	\$72,940.00	
Commissions to Duncan, Sherman & Co.,	178.70	
Interest on advances by W. F. Coolburgh		
& Co., -----	1,318.49	
Premium on New York draft refunded, -	30.00	\$74,467.19
<hr/>		
ADD—		
Amount transferred from discount, ---	3,051.01	77,518.20
<hr/>		

S T O C K .

36 wheelbarrows purchased, -----	\$140.00	
Sundries,-----	85.85	225.85
<hr/>		
ADD—		
Valuation meters furnished, -----	\$2,851.50	
DEDUCT—		
Old hydrants sold, -----	\$25.00	
Stop cock used, -----	200.00	
Depreciation of meters, -----	1,582.00	1,807.00
<hr/>		
	\$1,044.50	1,270.35

C O A L .

Coal purchased not used,-----	8,773.18	8,773.18
-------------------------------	----------	----------

I N C O M E .

Rents paid back, -----	42.75	42.75
------------------------	-------	-------

B O N D S .

Bonds, erroneously credited to Water Fund, trans-		
ferred to Sewerage Fund,-----	2,000.00	2,000.00

W A T E R P I P E S .

Pipes purchased and not used, -----	\$24,026.52	
DEDUCT—		
Amount due R. D. Wood & Co.,-----	4,597.08	19,429.44
<hr/>		
Amounts carried forward,-----	\$104,938.41	\$89,604.48

	CASH PAYMENT.	TRUE COST.
Amounts brought forward, -----	\$104,938.41	\$89,604.48

SERVICE COCKS.

Services of tapper, -----	\$958.00	
Service cocks purchased, -----	2,975.17	
Cast iron boxes and iron work, -----	1,312.83	
Permits, not used, refunded, -----	19.95	
Hay, oats, and feed, -----	259.95	
Carpenter work, -----	35.27	
Hardware, -----	21.60	
Horse shoeing, -----	5.50	
Lumber, -----	21.42	
Laying lead pipes, -----	50.25	
Plugs, -----	45.60	
Miscellaneous, -----	26.28	5,731.82
	<u>\$5,731.82</u>	
ADD—		
Service cocks, previously paid for, -----	\$206.16	
	<u>\$5,937.98</u>	5,937.98
Cash receipts for tapping, -----	\$5,120.00	
Work done for private parties, -----	35.03	
Drill sold, -----	2.50	
Barn and hay, -----	69.00	
Service cocks on hand, April 1,		
1865, -----	1,410.84	
Profits on service cocks account, -----	699.39	
	<u>\$6,637.37</u>	<u>\$6,637.37</u>
	<u>\$110,670.23</u>	<u>\$95,542.46</u>
Total addition to Water Works brought forward, (not including Lake Tunnel,) -----	172,341.48	186,085.66
Lake Tunnel expenditures brought forward, -----	106,181.36	106,389.24
Total operating expenses brought forward, -----	99,822.05	96,076.77
	<u>\$489,015.12</u>	<u>\$484,094.13</u>
Total cash expenditures, -----	<u>\$489,015.12</u>	

SEWERAGE DEPARTMENT.

Trial Balance, Ledger, Board of Public Works, March 31, 1865.

	DE.	CR.
Cleansing Chicago River,-----	\$1,982.23	
Sewers North Division, -----	258,474.00	
Sewers South Division,-----	353,734.83	
Sewers West Division, -----	370,382.22	
S. Lind, Treasurer Sewerage Commissioners,-----	107,116.73	
Sewerage Loan Bonds, 6 per cent.-----		\$87,000.00
Sewerage Loan Bonds, 7 per cent.-----		1,000,000.00
Sewerage Loan Bonds, cancelled, -----		100,000.00
Sewerage Sinking Fund, -----		37,831.61
Sewerage Sinking Fund Mortgages,-----	5,867.10	
Discount on Sewerage Bonds,-----	15,470.26	
Sewerage Loan Interest, -----		49,279.17
Sewerage Pipes,-----	5,944.86	
Sewerage Brick, -----	64.00	
Sewerage Stock,-----	3,318.38	
American Exchange Bank,-----	38,257.50	
House Drains, -----	16,106.00	
Dennis Coughlin,-----	1,561.51	
Galena & Chicago Union Railroad Co. -----		382.55
Sewerage Fund in hands of City Treasurer,-----	87,324.17	
Cement Account,-----	310.19	
Sewerage Sinking Fund with City Treasurer, -----	271.55	
Langan & McHugh, contractors, -----		627.44
Lot 3, Block 4, (E. $\frac{1}{2}$) Kinzie's Addition, -----	68.50	
South-half Lot 5, Block 123, School Section Add. ---	22.18	
Pittsburgh, Fort Wayne & Chicago Railroad Co. ----		616.84
Z. Cobb, ag't., 80 feet west half Lot 7, Block 36, O.T. ---	31.53	
Chicago, Burlington & Quincy Railroad Co. -----		6,744.01
Charles H. Cook,-----		69.00
Sewerage man hole and catch basin covers,-----	941.67	
Sewerage Expenses and Repairs, -----	16,357.61	
Owners Lots 1, 2, 7, and 8, Block 5, J. R. Storrs' Add. ---	94.54	
Martin Muleney, contractor,-----		1,150.94
	<u>\$1,283,701.56</u>	<u>\$1,283,701.56</u>

SEWERAGE FUND.

STATEMENT of the Cash Receipts by the Board of Public Works, from April 1, 1864, to March 31, 1865 inclusive, and detailed statement of the cost of the various operations conducted by the Board during the same time:—

RECEIPTS.

Proceeds of 65 seven per cent. bonds sold, including premium and interest, -----	\$76,083.07	
Rec'd from City account of Sewerage Tax, 1863, ---	3,593.59	
Rec'd from City account of Sewerage Tax, 1864, ---	131,715.11	
House drain permits issued,-----	2,626.45	
Materials sold and work done for private parties,--	1,639.29	
S. Lind, proceeds of McCaffrey's note, -----	1,134.80	
Pat'k Smith, collected of S. McKay,-----	1,347.75	
Interest on the same, -----	513.25	
Interest on collateral of E. I. Tinkham & Co.,-----	210.00	
Discount on New York draft, -----	45.99	
Thirteen Bonds sold on account,-----	13,000.00	
	<u>\$231,909.30</u>	
Balance in hands of City Treasurer, April 1, 1864,	79,145.52	<u>\$311,054.82</u>

EXPENDITURES.

SEWERS—SOUTH DIVISION.

CASH PAYMENT. TRUE COST.

Labor, -----	\$3,129.73	
Services of Engineer, -----	1,023.05	
Cement, -----	59.62	
Lumber, -----	24.58	
Repairing gas pipe, -----	55.16	
Inspecting, -----	242.17	
Horse Keeping, -----	46.21	
Rodman, -----	35.33	
Brick, -----	458.29	
Repairing water truck,-----	20.50	
Services of draughtsman, -----	75.00	
Miscellaneous, -----	55.69	\$5,225.33
Amount carried forward, -----		<u>\$5,225.33</u>

		CASH PAYMENT.	TRUE COST.
Amounts brought forward, -----		\$5,225.33	
ADD—			
Pipe used previously, paid for, -----	48.00		
Covers used previously paid for, -----	36.00		
Expense Sewer on Harrison Street,---	433.00		
“ “ Twenty-Second St.,-	2,564.06		
“ “ Wabash Ave., -----	7,497.29		
“ “ Indiana Ave. -----	4,805.45		
“ “ State Street, -----	3,993.54		
“ “ Michigan Ave.,-----	11,668.50		
“ “ Fourteenth Street,--	1,814.11		
“ “ Sixteenth Street, ---	1,360.64		
Cement used,-----	411.43		
DEDUCT—	\$35,064.02		
Receipts for work done,-----	\$26,50		
Lanagan & McHugh, failure to			
fulfil contract awarded, -----	66.67	\$93.17	
	\$34,970.85		\$40,196.18

SEWERS—WEST DIVISION.

Labor,-----	\$1,984.58		
Service of Engineer,-----	1,032.09		
Cement,-----	21.38		
Repairing gas pipe,-----	159.94		
Brick,-----	311.97		
Inspecting,-----	239.33		
Horse keeping,-----	46.22		
Rodman,-----	35.34		
Sand,-----	12.00		
12 inch pipe sewer on Willard Place, ---	69.00		
Repairing water truck,-----	20.50		
Drain on Maxwell Street,-----	54.00		
Draughtsmen,-----	75.00		
D. Coughlin's men on Polk Street.-----	516.29		
Miscellaneous,-----	70.74	4,648.38	
ADD—			
Covers used previously paid for, -----	24.00		
Pipe used previously paid for,-----	260.40		
Cement used previously paid for,-----	572.38		
Expense Sewer on North Street,-----	95.00		
“ “ Reuben Street,-----	15.00		
“ “ Maxwell Street,-----	4,661.00		
Amounts carried forward, -----	\$5,627.78	\$9,873.71	\$40,196.18

		CASH PAYMENT.	TRUE COST.
Amounts brought forward, -----	\$5,627.78	\$9,873.71	\$40,196.18
Expense sewer on Sheldon Street, ----	292.00		
“ “ Canal Street, -----	33.58		
“ “ Peck Street, -----	1,096.42		
“ “ Rucker Street, -----	1,189.64		
“ “ Sangamon Street, --	2,468.14		
“ “ St. John's Place, ---	2,055.98		
“ “ Elizabeth Street, ---	1,026.23		
“ “ Peoria Street, -----	1,018.05		
“ “ Morgan Street, ----	1,296.40		
“ “ May Street, -----	2,468.71		
“ “ Green Street, -----	1,469.92		
“ “ Jefferson Street, ---	759.17		
“ “ Halstead Street, ---	1,210.37		
“ “ Mitchell Street, ---	52.00		
“ “ Throop Street, -----	467.50		
Repairing gas pipe, -----	20.00		
DEDUCT—	22,551.89		
Rec'd for Maxwell St. drain, \$54.00			
Lanagan & McHugh, failure			
to fulfil contract awarded, 66.67	120.67		
	22,431.22		27,079.60
SEWERS—NORTH DIVISION.			
Labor, -----	\$2,358.36		
Services of Engineer, -----	923.72		
Repairing tools, -----	18.53		
Lumber, -----	30.04		
Repairing gas pipe, -----	55.16		
Inspecting, -----	171.34		
Horse keeping, -----	46.21		
Brick, -----	220.89		
Filling to protect sewers, -----	324.50		
Repairing truck, -----	20.50		
Service of draughtsman, -----	75.00		
Clay, -----	134.70		
Miscellaneous, -----	71.61	\$4,450.56	
ADD—			
Pipe used previously paid for, -----	\$795.00		
Covers used previously paid for, -----	60.00		
Cement used previously paid for, -----	417.26		
Expense Sewer on North Market St., -	16.00		
“ “ Chicago Ave., -----	383.50		
Amounts carried forward, -----	\$1,671.76	\$14,324.27	\$67,275.78

		CASH PAYMENT.	TRUE COST.
Amounts brought forward, '-----	\$1,671.76	\$14,324.27	\$67,275.78
Expense sewer on Division Street, ---	140.47		
" " Wolcott Street, ----	7,399.20		
" " Elm Street, -----	96.86		
" " White Street, -----	1,258.62		
" " Huron Street, -----	1,436.22		
" " Superior Street, ---	1,459.71		
" " Pearson Street, ----	1,992.52		
" " White & Wolcott Sts.,	106.44		
DEDUCT—	15,561.80		
Lanagan & McHugh, failure to fulfil contract awarded,-----	66.66		
	<u>\$15,495.14</u>		19,945.70
SEWERAGE—INTEREST.			
Interest on Sewerage Loan Bonds, July 1, 1864, and January 1, 1865,	\$74,345.00		
Interest on advance by W. F. Cool- baugh, & Co.,-----	221.33		
Commission to American Exch. Bank,--	183.59	74,749.92	
DEDUCT—			
Interest coll'd of S. McKay, -----	\$513.25		
Accrued interest on 25 bonds sold,----	593.07		
	<u>\$1,106.32</u>		73,643.60
CLEANSING SEWERS—SOUTH DIVISION			
Labor, -----	\$5,204.34		
Repairing tools, -----	6.25		
Water used for flushing, -----	186.12		
Miscellaneous,-----	7.62	5,404.33	5,404.33
CLEANSING SEWERS—WEST DIVISION.			
Labor, -----	\$1,828.50		
Repairing tools,-----	24.77		
Inspecting,-----	169.00		
Miscellaneous, -----	5.14	2,027.41	\$2,027.41
CLEANSING SEWERS—NORTH DIVISION.			
Labor, -----	\$1,842.85		
Water used for flushing, -----	131.83		
Amounts carried forward,-----	\$1,974.68	\$96,505.93	\$168,296.82

		CASH PAYMENT.	TRUE COST.
Amounts brought forward, -----	\$1,974.68	\$96,505.93	\$168,286.82
Repairing tools, -----	6.25		
Miscellaneous, -----	5.14	1,986.07	1,986.07

REPAIRS OF SEWERS—SOUTH DIVISION.

Labor, -----	\$1,055.60		
Cement, -----	21.87		
Brick, -----	36.83		
Repairing tools, -----	18.53		
Miscellaneous, -----	3.34	1,136.17	
ADD—			
Covers used previously paid for, -----	\$550.26		
Cement used previously paid for, -----	112.47		
Brick used previously paid for, -----	183.75		
	\$846.48		1,982.65

REPAIRS OF SEWERS—WEST DIVISION.

Labor, -----	\$893.79		
Cement, -----	35.12		
Brick, -----	63.83		
Miscellaneous, -----	3.33	996.07	
ADD—			
Covers used previously paid for, -----	\$586.46		
Cement used previously paid for, -----	34.94		
Brick used previously paid for, -----	185.08		
	\$806.48		1,802.55

REPAIRS OF SEWERS—NORTH DIVISION.

Labor, -----	\$626.52		
Cement, -----	16.26		
Brick, -----	10.24		
Miscellaneous, -----	3.33	656.35	
ADD—			
Covers used previously paid for, -----	\$126.26		
Cement used previously paid for, -----	16.72		
Brick used previously paid for, -----	13.10		
	\$156.08		812.43
Amounts carried forward, -----		\$101,280.59	\$174,880.52

FOURTH ANNUAL REPORT OF

	CASH PAYMENT.	TRUE COST.
Amounts brought forward,-----	\$101,280.59	\$174,880.52

HOUSE DRAINS.

Service of Engineer,-----	\$1,200.00		
Horse keeping for Engineer,-----	74.72		
Labor,-----	201.49		
Permits refunded,-----	36.50		
Inspecting,-----	738.50		
Services of draughtsman,-----	325.00		
Car tickets,-----	12.70		
Advertising private drain notice,-----	24.75	2,613.66	
	<hr/>		
DEDUCT—			
Cash receipts for permits,-----	\$2,626.45		
Labor for private parties,-----	24.52		
	<hr/>		
	\$2,650.97		
ADD—			
Pipe junctions used,-----	1,648.80		
	<hr/>		
	1,002.17		1,611.49

CLEANSING CHICAGO RIVER.

Expenses Desplaines Survey,-----	\$452.25		
" Calumet " -----	485.42		
Services of Engineers,-----	112.48		
Salaries of special Commissioners,-----	750.00		
Repairing Surveying instruments,-----	15.50		
Repairing wagons and tools,-----	24.25		
Drawing materials and paper,-----	16.00		
Blacksmith work, making stakes, &c.,---	15.58		
Advertising for plans,-----	17.25		
Miscellaneous,-----	19.50		
Labor,-----	74.00	1,982.23	1,982.23
	<hr/>		

MAN HOLE AND CATCH BASIN COVERS.

Labor,-----	\$999.25		
Oak lumber and freight,-----	1,661.49		
Nails and spikes,-----	321.28		
Ten barrels tar,-----	76.00	3,058.02	
	<hr/>		
DEDUCT—			
Covers sold,-----	\$280.28		
Covers used for sewers and repairs,---	2,363.98		
	<hr/>		
	2,644.26		413.76
		<hr/>	
		\$108,934.50	\$178,888.00

	CASH PAYMENT.	TRUE COST.
Amounts brought forward, -----	\$108,934.50	\$178,888.00

OFFICE EXPENSES AND SALARIES.

Salaries of Commissions,-----	\$2,562.45		
Salary of Secretary,-----	800.00		
Salary of City Engineer, -----	1,200.00		
Salary of Assistant Engineer,-----	500.00		
Salary of Superintendent, -----	750.00		
Salaries of Clerks,-----	2,641.68		
Blank books and Stationery,-----	228.94		
Adv'g (including proposals for bonds), -	291.50		
Daily papers and scientific works, -----	19.47		
Revenue Stamps, -----	109.99		
Painting and cleaning,-----	103.22		
Printing, including report April 1. 1864,	255.35		
Office furniture, -----	169.96		
Repairs,-----	7.39		
Fuel, -----	19.50		
Draughtsman, -----	27.78		
Miscellaneous, -----	93.23	9,780.46	9,780.46
	<hr/>		

SEWERAGE PIPES.

Pipes purchased,-----	\$3,718.73		
Labor and Miscellaneous,-----	66.87		
Freight on pipe,-----	104.02	3,889.62	
	<hr/>		

SEWERAGE STOCK.

Tools and repairing tools,-----	\$341.11		
Lumber,-----	51.37	392.48	
	<hr/>		
ADD—			
Steam Engine from Ringold Place sewer,	\$500.00		892.48

SEWERAGE BRICK.

Brick purchased and labor, -----	261.31
----------------------------------	--------

CEMENT ACCOUNT.

Cement purchased, -----	1,882.95
-------------------------	----------

NORTH STREET SEWER.

Brick \$81.00, Labor \$14.00, -----	95.00		
	<hr/>		
Amounts carried forward,-----	\$125,236.32	\$189,560.94	

CASH PAYMENT. TRUE COST.

Amounts brought forward, -----

\$125,236.32 \$189,560.94

HARRISON STREET SEWER.

Brick \$385.00 Labor \$48.00, ----- 433.00

NORTH MARKET STREET SEWER.

Two centers left in sewer, ----- 16.00

CHICAGO AVENUE SEWER.

Filling street, -----	\$315.25	
Labor \$62.00, Sand \$6.25, -----	68.25	383.50

REUBEN STREET SEWER.

Labor, ----- 15.00

DIVISION STREET SEWER.

Lanagan & McHugh balance contract, --- 140.47

MAXWELL STREET SEWER. 793 FEET. 5 FEET SEWER.

W. Carter, balance contract, -----	\$115.58	
Services of Engineer, -----	72.22	
Bricks, -----	2,087.50	
M. Mulaney, on contract, -----	2,022.18	
Labor, -----	90.50	4,387.98

ADD—

Covers used, -----	\$15.00
Pipe used, -----	\$16.20
	<u>\$31.20</u>

DEDUCT—

Brick sold, -----	\$115.00	83.80
-------------------	----------	-------

WOLCOTT STREET SEWER. 1420 FEET 3 FEET. 275 FEET 1 FEET.

Lanagan & McHugh, balance contract, ---	\$228.50	
Wm. Woodruff, contract, -----	4,971.75	
Brick, -----	1,838.63	
Labor and inspecting, -----	289.00	
Engineers services, -----	38.89	
Cement, -----	52.50	7,419.27

Amounts carried forward, -----

\$138,031.54 \$189,560.94

	CASH PAYMENT.	TRUE COST.
Amounts brought forward,-----	\$138,031.54	\$189,560.94

ADD—

Covers used, ----- \$72.00

Pipe used, ----- 28.15

\$100.15

DEDUCT—

Brick used for other purpose,-- \$120.22 \$20.07

ELM STREET SEWER.

Lanagan & McHugh balance contract,----- 96.86.

SHELDON STREET SEWER.

Brick, ----- \$260.00

Labor and inspecting,----- 32.00 292.00

CANA STREET SEWER.

W. Carter, balance contract,----- \$16.43

Repairing gas pipe broken by sewer, --- 17.15 33.58

RUCKER STREET SEWER. 489 FEET. 2 FEET SEWER.

W. Carter, contract,----- \$1,009.61

Labor and inspecting,----- 148.83 1,158.44

ADD—

Covers used,----- \$18.00

Pipe used,----- 13.20 \$31.20

PECK STREET SEWER. 338 FEET. 2 FEET SEWER.

W. Carter, balance contract,----- \$174.17

M. Mulaney, on contract, ----- 545.87

Brick, ----- 247.00

Labor,----- 18.50 985.54

ADD—

Covers used,----- \$18.00

Pipe used,----- 11.55

\$29.55

DEDUCT—

Brick used elsewhere,----- \$15.00 \$14.55

Amount carried forward,-----	<u>\$140,597.96</u>	<u>\$189,560.94</u>
------------------------------	---------------------	---------------------

	CASH PAYMENT.	TRUE COST.
Amounts brought forward,-----	\$140,597.96	\$189,560.94

WHITE STREET SEWER. 755½ FEET. 2 FEET.

Wm. Woodruff, contract, -----	\$755.50	
Brick, -----	432.32	
Labor and inspecting, -----	37.00	1,224.82
	<hr/>	

ADD—

Covers used, -----	\$42.00
Pipe used, -----	19.80

61.80

DEDUCT—

Brick used elsewhere, -----	\$28.00	\$33.80
-----------------------------	---------	---------

HURON STREET SEWER. 842 FT. 2 FT. 731 FT. 1 FT.

Lanagan & McHugh, balance contract, ---	\$393.89	
Wm. Woodruff, contract, -----	408.00	
Brick, -----	385.78	
Labor and inspecting, -----	213.45	1,401.12
	<hr/>	

ADD—

Covers used, -----	\$36.00
Pipe used, -----	23.10

59.10

DEDUCT—

Brick used elsewhere, -----	\$24.00	\$35.10
-----------------------------	---------	---------

SUPERIOR STREET SEWER. 844 FT. 2 FT. 382 FT. 1 FT. SEWER.

Lanagan & McHugh, balance contract, ---	\$393.87	
Wm. Woodruff, contract, -----	412.00	
Brick, -----	382.90	
Labor and inspecting, -----	241.84	1,430.61
	<hr/>	

PEARSON STREET SEWER. 929 FT. 2 FT. 159 FT. 1 FT. SEWER.

Lanagan & McHugh, balance contract, ---	\$394.15	
Wm. Woodruff, contract, -----	882.00	
Brick, -----	469.32	
Services of Engineer, -----	60.63	
Labor and inspecting, -----	158.97	1,965.07
	<hr/>	

Amounts carried forward, -----

\$146,619.58	\$189,560.94
--------------	--------------

	CASH PAYMENT. TRUE COST.	
Amounts brought forward, -----	\$146,619.58	\$189,560.94
ADD—		
Covers used, -----	\$36.00	
Pipe used, -----	21.45	
	<u>\$57.45</u>	
DEDUCT—		
Brick used elsewhere, -----	\$30.00	24.45
	<u> </u>	

WHITE AND WOLCOTT STREET SEWER.

Lanagan & McHugh, balance contract, -- 106.44

TWENTY-SECOND STREET SEWER. 453 FEET. 3 FEET.

M. Mulaney, on contract, -----	\$477.36	
Brick, -----	2,108.37	
Services of Engineer, -----	54.16	
Labor and inspecting, -----	231.33	
Cleansing, -----	149.00	3,020.22

ADD—		
Covers used, -----	\$12.00	
Pipe used, -----	6.60	
	<u>\$18.60</u>	

DEDUCT—			
Brick used elsewhere, --	\$59.00		
Engine charged stock			
account, -----	500.00	\$559.00	\$540.40
	<u> </u>	<u> </u>	<u> </u>

WABASH AVENUE SEWER. 1387 FT. 2½ FT. 984 FT. 1 FT.

Thos. Mackin, contract and extra compensation allowed by Common Council, --	\$5,705.37	
Brick, -----	396.16	
Labor and inspecting, -----	938.19	
Cement, -----	195.22	
Hauling and inspecting brick, -----	143.50	
Miscellaneous, -----	33.85	7,412.29

ADD—		
Covers used, -----	\$138.00	
Pipe used, -----	33.00	
	<u>\$171.00</u>	

DEDUCT—		
Brick used elsewhere, -----	86.00	85.00
	<u> </u>	

Amounts carried forward, -----	\$157,158.53	\$189,560.94
--------------------------------	--------------	--------------

CASH PAYMENT. TRUE COST.

Amounts brought forward, ----- \$157,158.53 \$189,560.94

INDIANA AVENUE SEWER. 1262 FEET. 2 FEET.

Thos. Mackin, contract, -----	\$4,244.24	
Services of Engineer, -----	108.33	
Brick, -----	67.20	
Labor and inspecting, -----	250.85	
Cement, -----	93.43	4,764.05

ADD—

Covers used 66.00, Pipe used, 13.20, 79.20

DEDUCT—

Brick used elsewhere, -----	\$37.80	\$41.40
-----------------------------	---------	---------

STATE STREET SEWER. 1318 FEET. 2½ FEET.

Thos. Mackin, contract and extra compensation allowed by Common Council, ---	\$2,936.18	
Brick, -----	655.00	
Services of Engineer, -----	108.33	
Cement, -----	97.58	
Labor and inspecting, -----	160.00	3,957.09

ADD—

Covers used, ----- \$60.00

Pipe used, ----- 21.45

	\$81.45
--	---------

DEDUCT—

Brick used elsewhere, -----	45.00	\$36.45
-----------------------------	-------	---------

ST. JOHN'S PLACE SEWER. 781 FEET. 2 FT. 85 FEET. 1 FT.

M. Mulaney, on contract, -----	\$544.26	
Lanagan & McHugh, on contract, -----	637.82	
Brick, -----	452.00	
Services of Engineer, -----	38.89	
Labor and inspecting, -----	142.63	1,815.60

ADD—

Covers used, ----- \$42.00

Pipe used, ----- 19.80

	\$61.80
--	---------

DEDUCT—

Brick used elsewhere, -----	\$30.00	31.80
-----------------------------	---------	-------

Amounts carried forward, -----	\$167,695.27	\$189,560.94
--------------------------------	--------------	--------------

	CASH PAYMENT. TRUE COST.	
Amounts brought forward, -----	\$167,695.27	\$189,560.94
ELIZABETH STREET SEWER. 451½ FEET. 2 FEET.		
Lanagan & McHugh, on contract, -----	\$648.59	
Brick, -----	192.00	
Labor and inspecting, -----	46.00	886.59
ADD—		
Covers used, -----	\$24.00	
Pipe used, -----	13.20	
	<u>\$37.20</u>	
DEDUCT—		
Brick used elsewhere, -----	12.00	25.20
MICHIGAN AVENUE SEWER. 2062 FT. 2½ FT. 1220 FT. 2 FT.		
T. Mackin, contract and extra compensation allowed by Council, -----	\$8,841.65	
Brick, -----	1,575.87	
Freight on brick, -----	198.00	
Services of Engineer, -----	216.66	
Cement, -----	242.97	
Receiving and hauling brick, -----	359.00	
Labor and inspecting, -----	183.55	11,617.70
ADD—		
Covers used, -----	\$144.00	
Pipe used, -----	33.00	
	<u>\$177.00</u>	
DEDUCT—		
Brick used elsewhere, -----	167.00	\$10.00
PEORIA STREET SEWER. 471 FEET. 2 FEET.		
Lanagan & McHugh, on contract, -----	\$676.62	
Brick, -----	141.61	
Labor and inspecting, -----	52.25	870.48
ADD—		
Covers used, -----	\$24.00	
Pipe used, -----	13.20	
	<u>\$37.20</u>	
DEDUCT—		
Brick used elsewhere, -----	9.00	\$28.20
Amounts carried forward, -----	<u>\$181,070.04</u>	<u>\$189,560.94</u>

	CASH PAYMENT.	TRUE COST.
Amounts brought forward, -----	\$181,070.04	\$189,560.94
FOURTEENTH STREET SEWER. 487¼ FEET. 2 FEET.		
M. Mulaney, on contract,-----	\$1,188.65	
do. extra work and materials,--	60.53	
Brick,-----	264.00	
Services of Engineer,-----	36.11	
Labor and inspecting,-----	44.16	1,593.45
ADD—		
Covers used,-----	\$18.00	
Pipe used,-----	9.90	
	<u>\$27.90</u>	
DEDUCT—		
Brick used elsewhere,-----	17.00	\$10.90
	<u>17.00</u>	
SIXTEENTH STREET SEWER. 419½ FEET. 2 FT. 50 FEET. 1 FT.		
M. Mulaney, on contract,-----	\$891.04	
do. extra work and materials,--	63.92	
Brick,-----	198.00	
Labor and inspecting,-----	40.67	1,193.63
ADD—		
Covers used elsewhere,-----	\$18.00	
Pipe used,-----	3.30	
	<u>\$21.30</u>	
DEDUCT—		
Brick used elsewhere,-----	12.00	9.30
	<u>12.00</u>	
MORGAN STREET SEWER. 425 FEET 2 FT.		
Lanagan & McHugh, on contract,-----	610.53	
do. extra work and materials,--	77.74	
Brick,-----	429.76	
Labor and inspecting,-----	66.00	1,184.03
ADD—		
Covers used,-----	\$18.00	
Pipe used,-----	1.65	
	<u>\$19.65</u>	
DEDUCT—		
Brick used elsewhere,-----	15.00	\$4.65
	<u>15.00</u>	
Amounts carried forward,-----	\$185,041.15	\$189,560.94

	CASH PAYMENT.	TRUE COST.
Amounts brought forward, -----	\$185,041.15	\$189,560.94

MAY STREET SEWER. 922 FEET. 2 FEET.

Lanagan & McHugh, on contract, -----	\$1,324.47	
Brick, -----	602.00	
Services of Engineer, -----	99.53	
Labor and inspecting, -----	180.00	
Cement, -----	5.00	2,211.00

ADD—

Covers used, -----	\$36.00
Pipe used, -----	16.50
	<u>\$52.50</u>

DEDUCT—

Brick used elsewhere, -----	36.00	16.50
-----------------------------	-------	-------

GREEN STREET SEWER. 521 FEET. 2 FEET. 431 FEET. 1 FT.

Lanagan & McHugh, on contract, -----	\$748.33	
Brick, -----	236.03	
Labor and inspecting, -----	340.50	1,324.86

ADD—

Covers used, -----	\$18.00
Pipe used, -----	9.90
	<u>\$27.90</u>

DEDUCT—

Brick used elsewhere, -----	15.00	12.90
-----------------------------	-------	-------

HALSTED STREET SEWER. 653 FEET. 2 FEET.

M. Mulaney, on contract, -----	\$527.31	
Brick, -----	425.00	
Services of Engineer, -----	54.17	
Labor and inspecting, -----	94.00	1,100.48

ADD—

Covers used, -----	\$30.00
Pipe used, -----	14.85
	<u>\$44.85</u>

DEDUCT—

Brick used elsewhere, -----	28.00	\$16.85
-----------------------------	-------	---------

Amounts carried forward, -----	<u>\$189,677.49</u>	<u>\$189,560.94</u>
--------------------------------	---------------------	---------------------

	CASH PAYMENT.	TRUE COST.
Amounts brought forward, -----	\$189,677.49	\$189,560.94
MITCHELL STREET SEWER.		
Inspecting, -----		52.00
THROOP STREET SEWER.		
Brick, -----	\$447.50	
Labor moving brick, -----	20.00	467.50
		<hr/>
JEFFERSON STREET SEWER. 475 FEET. 2 FEET.		
M. Mulaney, on contract, -----	\$327.17	
Brick, -----	312.50	
Labor and inspecting, -----	36.00	675.67
		<hr/>
ADD—		
Covers used, -----	\$24.00	
Pipe used, -----	16.50	
	<hr/>	
	\$40.50	
DEDUCT—		
Brick used elsewhere, -----	14.00	\$26.50
	<hr/>	
SANGAMON STREET SEWER. 935 FEET. 2 FEET.		
W. Carter, contract, -----	\$1,269.75	
Brick, -----	\$974.30	
Labor and inspecting, -----	195.19	2,439.24
	<hr/>	
ADD—		
Covers used, -----	\$42.00	
Pipe used, -----	9.90	
	<hr/>	
	\$51.90	
DEDUCT—		
Brick used elsewhere, -----	\$23.00	\$28.90
	<hr/>	<hr/>
MISCELLANEOUS.		
Amount paid to Sinking Fund for its proportion of Sewerage Tax, 1863, collected,		17,398.75
W. F. Coolbaugh & Co., amount advanced on bonds, -----		13,000.00
Adver'ing Master's sale in case of S. Lind, Treasurer, -----		20.00
		<hr/>
		223,730.65
Balance in hands of City Treasurer, April 1, 1865, -----		87,324.17
		<hr/>
		\$311,054.82
		<hr/> <hr/>

SEWERAGE SINKING FUND.

RECEIPTS.

Proportion, Sewerage Tax, 1863, -----	\$17,398.75	
Balance of principal Sinking Fund Mortgage, William Hildebrand,-----	10,600.00	
Interest on same, -----	2,659.18	
Balance rec'd of E. $\frac{1}{4}$ lot 2, block 31, O. T.,-----	396.07	
	<u>\$31,054.00</u>	
Balance in hands of City Treasurer, April 1, 1864,--	\$15,957.55	47,011.55

EXPENDITURES.

Forty-two Bonds purchased and cancelled, Nos. 1121 to 1162 inclusive, 7 per cent,-----	\$42,000.00	
Premium and accrued interest on the same, -----	4,740.00	
	<u>\$46,740.00</u>	
Balance in hands of City Treasurer, April 1, 1865,--	\$271.55	\$47,011.55

CITY DEPARTMENT.

Trial Balance, Ledger, Board of Public Works, March 31, 1865.

	DR.	CR.
City Appropriation Fund,-----	\$44,828.76	
South Division,-----		\$1,811.01
West Division,-----		9,150.74
North Division,-----	1,812.55	
Maxwell Street Engine House,-----	65.09	
Hospital on Cemetery Grounds,-----		1,606.82
Street Lamps, West Division,-----		282.35
Public Buildings,-----		9,135.90
Paving in front of Post Office,-----		814.66
Chicago Cemetery,-----		778.68
Lumber account,-----	214.19	
Twelfth Street Bridge,-----		12,000.00
North Market,-----		871.47
Chicago Harbor,-----		2,965.67
Public Parks,-----		940.74
Intersections of streets,-----		6,595.41
Canal Street improvement,-----	31.73	
North Clark Street improvement, straightening,-----		800.00
Dredging Bar at mouth of Harbor,-----	42,748.69	
Special Appropriation,-----		70,849.05
City Proportional Expense Account,-----		9.72
City Expense Account Office,-----	97.52	
North Pier extension,-----	28,154.48	
House Numbering,-----	104.85	
Bridge Department,-----	554.26	
Special Assessments,-----	92,552.73	
South Water Street improvement,-----		80.92
Kinzie and N. Water Streets improvement,-----		370.29
Sundry sidewalk improvements,-----		1,311.55
West Lake Street improvement,-----		8,414.52
Canal Street improvement, W. 493 W.,-----		128.76
Improvement Alley, Block 46 Kinzie's Add.,-----		100.00
Opening Alley S. W. $\frac{1}{4}$ Lot 5, Block 64, C. T. Sub.,-----		110.00
North Clark Street improvement, W. 202 N.,-----		860.00
Canal Street improvement, W. 528 W.,-----		29.14
Milwaukee Avenue improvement,-----		3,285.43
Amounts carried forward,-----	\$211,164.95	\$133,302.83

Amounts brought forward, -----	\$211,164.95	\$133,302.83
Improvement Alley, Block 7 Ft. Dearborn Add., ---	211.38	
Alley Block 46 O. T.,-----		317.10
Holt Street improvement, -----		16.81
Walnut Street improvement, -----		490.37
Alley Block 45 Sec. 7, 39, 14, -----		334.56
Fourteenth Street improvement,-----		6,266.97
Dredging South Branch near Bridgeport, -----		3,689.37
Eighteenth Street improvement, -----		3,520.00
Private Drain Assessment, J. R. & S. Add., -----		22.18
North Clark Street improvement, W. 201 No., -----		1,303.55
Division Street improvement, -----		4,120.83
West White Street improvement,-----		19,122.30
La Bar Street improvement, -----		2,576.75
North Avenue improvement, -----		8,664.35
Alley Block 2 Clark's Add., -----		109.51
“ “ 6 Assessors' Division,-----		50.00
“ “ 7 “ -----		50.00
“ “ 8 “ -----		50.00
“ “ 9 “ -----		50.00
“ “ 13 “ -----		50.00
“ “ 14 “ -----		50.00
“ “ 15 “ -----		50.00
“ “ 16 “ -----		50.00
Twentieth Street improvement,-----		12,400.24
Alley Block 9 Sampson & Green's Add.,-----		279.47
Fourteenth Street improvement (for deficiency),----		4,457.20
Lumber Street improvement, -----		2,555.21
West Eighteenth Street improvement, -----		1,069.71
Alley N. $\frac{1}{2}$ Block 68 Sec. 21, 39, 14 E.,-----		266.05
Alley N. $\frac{1}{2}$ Block 45 C. T. Sub.-----		529.10
Private Drain Assessment Kinzie's Add., -----		68.50
Sundry Lamp Post Assessments, -----		5,493.38
	<u>\$211,376.33</u>	<u>\$211,376.33</u>

BOARD OF PUBLIC WORKS APPROPRIATION FUND.

STATEMENT of the Cash Receipts by the Board of Public Works from April 1, 1864, to March 31, 1865, inclusive; and detailed statement of the cost of the various operations conducted by the Board during the same time:—

RECEIPTS.

Amount appropriated by Common Council, -----	\$189,646.00	
Amount appropriated for North Market, -----	8,671.87	
Permits issued, -----	772.55	
Digging graves in Cemetery, and sand sold,-----	3,101.25	
Rent of lots, account Cemetery Fund,-----	140.50	
Lumber sold, -----	999.01	
Damages to bridges,-----	215.00	
Old iron sold from Rush Street bridge,-----	20.00	
Received from Chicago, Burlington, and Quincy, R. R. Co., account Canal Street improvement,-----	1,569.74	
Amounts erroneously charged, refunded,-----	155.87	
Rec'd from town of Lake its share of the cost of Egan Avenue bridge,-----	61.83	
Received for house numbers, -----	2,231.00	
Received from sundry special assessments for ex- penses incurred, -----	540.74	
Received for licenses and services of draughtsman, --	23.60	
Oil cloth sold,-----	5.00	
Repaving Streets, and repairing sidewalks,-----	537.92	
Grading Indiana Avenue,-----	81.25	
Hauling dirt and street cleaning, -----	75.50	
Proceeds of 12 Bonds appropriated March 23, 1863, and 3 Bonds appropriated July, 11, 1864, for State Street bridge, -----	16,500.00	
	<u>\$225,348.63</u>	
Balance in hands of City Treasurer, April 1, 1864,--	35,088.78	<u>\$260,437.41</u>

EXPENDITURES.

SOUTH DIVISION.

CASH PAYMENT. TRUE COST.

Labor on streets and sidewalks, -----	\$25,605.59	
Lumber, -----	4,963.39	
Stone, -----	1,591.15	
Gravel, -----	501.36	
Nails and spikes, -----	750.50	
Rodman, -----	175.32	
Distributing sidewalk notices, -----	1,481.25	
Repairing paving, -----	338.18	
Six barrels composition, -----	42.00	
Tools and repairs, -----	98.43	
Lettering street signs, -----	44.60	
Furnace, -----	18.00	
Stable Rent, -----	8.33	
Miscellaneous, -----	61.02	\$35,679.12

ADD—

Sand from Cemetery, ----- \$12.50

DEDUCT—

Permits issued, -----	\$257.47	
Sidewalks constructed, -----	67.07	
Grading Indiana Avenue, ----	81.25	
Planking West Lake St, -----	50.00	
Gravel and stone sold, -----	41.00	
Paving, -----	420.85	917.64
		<u>\$905.14</u>

\$34,773.98

WEST DIVISION.

Labor on streets and sidewalks, -----	\$27,353.67
Lumber, -----	4,466.89
Stone, -----	3,314.73
Nails and spikes, -----	809.25
Rodman, -----	150.02
Distributing sidewalk notices, -----	3,145.00
Tools and repairs, -----	157.31
Street Signs, -----	11.20
Service pipe to post cor. Lake and Water Streets, -----	60.15
Filling cellar West Market, -----	50.00
Rent of stable, -----	8.33
P. Rorke, grading, -----	75.00
Repairing and constructing sidewalks, --	117.03

Amounts carried forward, -----	\$39,718.58	\$35,679.12	\$34,773.98
--------------------------------	-------------	-------------	-------------

		CASH PAYMENT.	TRUE COST.
Amounts brought forward, -----	\$39,718.58	\$35,679.12	\$34,773.93
Miscellaneous, -----	50.50	39,769.08	
ADD—			
Stone previously paid for, -----	120.00		
DEDUCT—			
Permits issued, -----	\$257.55		
Intersections, -----	87.52		
Hauling dirt, -----	111.50		
Labor on street, -----	25.87	482.44	
		<u>\$362.44</u>	39,406.64

NORTH DIVISION.

Labor on streets and sidewalks, -----	\$21,724.44		
Lumber, -----	2,222.44		
Stone, -----	3,305.54		
Nails and spikes, -----	360.75		
Rodman, -----	149.99		
Distributing sidewalk notices, -----	1,550.00		
Tools and repairs, -----	64.99		
Street signs, -----	52.37		
Paving, -----	12.50		
Watching sand, -----	225.00		
Land damages widening Division Street,	500.00		
Rent stable lot, -----	8.33		
Miscellaneous, -----	50.09	30,226.44	
ADD—			
Gravel and stone from South Division,	41.00		
DEDUCT—			
Permits issued, -----	\$257.53		
Hauling dirt and St. cleaning, -----	75.50	333.03	
		<u>\$292.03</u>	29,934.41

CHICAGO CEMETERY.

Labor and teams, -----	\$3,991.53		
Salary Superintendent, -----	566.66		
Lumber and nails, -----	491.09		
Hardware and tools, -----	22.88		
Printing interment tickets, -----	3.00		
Sawing and dressing lumber, -----	6.50		
Gravel ticket refunded, -----	1.00	5,082.66	
		<u>\$110,757.30</u>	<u>\$104,115.03</u>
Amounts carried forward, -----			

	CASH PAYMENT.	TRUE COST.
Amounts brought forward,-----	\$110,757.30	\$104,115.03
DEDUCT—		
Receipts, digging graves, sand		
sold, etc.,-----	\$3,143.75	
Rents of lots,-----	140.50	
	<u>\$3,284.25</u>	1,798.41

LUMBER ACCOUNT.

Lumber purchased, not used,-----	1,068.98	
DEDUCT—		
Lumber sold,-----	\$999.01	69.97

PUBLIC BUILDINGS.

ENGINE HOUSES.

Carpenter work,-----	\$188.63		
Lumber,-----	246.34		
Plumbing and gas fitting,-----	244.88		
Painting and glazing,-----	862.15		
Hardware,-----	25.53		
Hose tower U. P. H. engine house,-----	287.31		
Bell tower Union street,-----	300.00		
Bell tower North Avenue,-----	300.00		
Extra work on Long John engine house,	96.49		
Painting Blue Island Ave. engine house,	77.00		
Repairs on " " "	90.00		
Repairs on engine houses,-----	168.63		
Advertising for proposals to build,-----	12.38		
Five barrels composition,-----	40.00		
Nails,-----	10.75		
Miscellaneous,-----	13.38	2,963.47	2,963.47
	<u> </u>		

ISLAND QUEEN ENGINE HOUSE.

T. Menard on contract for building,----	\$600.00		
Carpenter work,-----	213.84		
Blacksmith work,-----	48.18		
Plastering,-----	273.30		
Five barrels composition,-----	40.00		
Sand,-----	26.00		
Plumbing and gas fitting,-----	363.29		
Pointing,-----	67.00		
Lumber,-----	260.98		
	<u> </u>		
Amounts carried forward,-----	\$1,892.59	\$114,789.75	\$108,946.88

		CASH PAYMENT.	TRUE COST.
Amounts brought forward, -----	\$1,892.59	\$114,789.75	\$108,946.88
House drain, -----	100.95		
Painting, -----	187.55		
Sheet brass, \$8.75, Nails, \$2.70, -----	11.45		
Hardware, -----	8.54		
Ripping lumber, -----	60.36		
Repairs, -----	29.63	2,291.07	
ADD—			
Hauling dirt by West Division, -----	111.50		
DEDUCT—			
Refunded by E. Baggott, -----	100.00		
	<u>\$11.50</u>		2,302.57

MAXWELL STREET ENGINE HOUSE.

Elliott & Tnielan, contract, -----	\$4,875.00		
Extending water pipe to engine house, -	75.00		
Lumber, -----	61.09		
House drain, -----	54.00	5,065.09	5,065.09

COURT HOUSE.

Carpenter work, -----	\$6.75		
Painting and glazing, -----	14.70		
Repairs City Clerk's office, -----	9.85		
Painting and cleaning City Attorney's office, -----	44.00		
Repairing water-closets, -----	15.75		
Plumbing, -----	18.25		
Cementing roof, -----	116.80		
New gas burners, -----	18.20		
Repairs on roof, -----	6.00		
Painting and glazing for alarm telegraph,	199.70		
Steam pipe and fixtures for " "	130.00		
Labor in square, -----	48.00		
Repairing fountain, -----	9.40		
Dressing lumber, -----	6.50	643.90	643.90

HOSPITAL ON CEMETERY GROUNDS.

J. McEwen, contract carpenter work, --	\$7,550.00		
C. Pasch, contract masonry work, -----	4,735.00		
Extra carpenter and masonry work, ----	280.25		
Amounts carried forward, -----	\$12,565.25	\$122,789.81	\$116,958.44

CASH PAYMENT. TRUE COST.

Amounts brought forward,-----	\$12,565.25	\$122,789.81	\$116,958.44
Two furnaces complete,-----	392.20		
Lumber for fence,-----	242.98		
Nails, bolts, and hinges,-----	28.50		
Building fence,-----	152.25		
Advertising for proposals for building,--	12.00	13,393.18	13,393.18

BRIDEWELL.

Nails,-----	\$23.75		
Building dock,-----	315.00		
Painting and glazing,-----	6.27	345.02	345.02

ARMORY.

Carpenter work,-----	\$24.37		
Painting and glazing,-----	145.06		
Repairing roof,-----	115.45		
Repairing and Plastering,-----	260.00		
Ripping and sawing lumber,-----	3.50		
Hardware,-----	1.95	550.33	550.33

NORTH MARKET.

Plumbing,-----	\$155.85		
Filling holes,-----	10.00		
Carpenter work,-----	9.00		
Painting and glazing,-----	79.29		
Water and gas pipe,-----	26.70		
Screws, hinges, nails, and bolts,-----	5.32		
Spouting,-----	78.00		
Eighty-three patent gas burners,-----	29.05		
Street lamp 2d precinct police station,--	8.00	401.21	401.21

NORTH MARKET RAISING.

Ely & Smith, contract,-----	\$2,110.50		
Thos. Mackin, on account contract,-----	5,000.00		
Inspecting,-----	137.50		
Labor on drain,-----	25.75		
Raising scale,-----	36.61		
Hardware,-----	6.71		
Carpenter work,-----	15.00		
Lumber,-----	155.57		
	<u>\$7,486.64</u>	<u>\$137,479.55</u>	<u>\$131,648.18</u>

		CASH PAYMENT.	TRUE COST.
Amounts brought forward,-----	\$2,487.64	\$137,479.55	\$131,648.18
Gas and water in excess of receipts,-----	280.51		
Advertising proposals for improvements,	32.25	7,800.40	7,800.40

BRIDGE DEPARTMENT

Carpenter work, -----	4,641.52		
Spikes, nails, and chain,-----	602.31		
Lumber, -----	698.48		
Tools and hardware,-----	21.23		
Hauling coal,-----	24.38		
Lard and kerosene oils, -----	539.06		
Lantern and lamp chimneys, -----	10.40		
Blacksmith work, -----	277.49		
Altering patterns, -----	19.23		
Painting and glazing,-----	78.62		
Screws, -----	8.93		
Hay, oats, and feed, -----	96.13		
Iron work, -----	16.75		
Metal reflectors for bridges,-----	144.00		
Service pipe Indiana Street bridge, -----	107.58		
Seventy-four piles, -----	587.32		
Freight on piles, -----	75.00		
Castings, -----	31.00		
Repairing wagon, -----	16.44		
Miscellaneous, -----	8.50	8,004.37	

ADD—

Iron from Rush Street bridge, ----- \$501.41

DEDUCT—

Amount rec'd from town of Lake, \$61.83 -----

Damage to bridges, -----	215.00	276.83	8,228.95
		224.58	

NORTH AVENUE BRIDGE.

Carpenter work, -----	5.50		
Blacksmith work, -----	12.79		
Coal, -----	20.80		
Lumber, -----	10.82	49.91	49.91

NEW NORTH AVENUE BRIDGE.

Draughtsman, -----	\$9.15		
Advertising for proposals, -----	8.25	17.40	17.40
Amounts carried forward,-----		\$153,351.63	\$147,744.84

	CASH PAYMENT.	TRUE COST.
Amounts brought forward, -----	\$153,351.63	\$147,744.84

FULLER STREET BRIDGE.

Draughtsman, -----	\$9.15		
Advertising for proposals, -----	8.25	17.40	17.40
	<hr/>		

CLYBOURNE AVENUE BRIDGE.

Carpenter work, -----	\$2.50		
Hardware, \$0.90, Coal, \$8.40, -----	9.30	11.80	11.80
	<hr/>		

CHICAGO AVENUE BRIDGE.

Carpenter work, -----	\$7.50		
Repairs, -----	51.58		
Use of pile driver, -----	120.50		
Lumber, -----	63.43		
Coal, \$30.20, Hardware, \$2.25, -----	32.45	275.46	275.46
	<hr/>		

ERIE STREET BRIDGE.

Carpenter work, -----	\$13.63		
Lumber, -----	50.02		
Towing bridge to Miller's boxes, -----	112.00		
Coal, -----	30.20		
Bell, \$8.00, Pump plunge, \$1.50, -----	9.50		
Nails and spikes, -----	51.66	267.01	267.01
	<hr/>		

INDIANA STREET BRIDGE.

Carpenter work, -----	\$19.50		
Lumber, -----	183.79		
Two lamp posts and lamps, -----	58.00		
Nails and spikes, -----	79.42		
Repairs, -----	171.82		
Towing bridge to dry dock, -----	50.00		
Coal, \$16.80, Bell, \$8.00, -----	24.80		
Blacksmith work, -----	38.32	625.65	625.65
	<hr/>		

KINZIE STREET BRIDGE.

Carpenter work, -----	\$45.25		
Nails and spikes, -----	5.52		
	<hr/>		
Amounts carried forward, -----	\$ 50.77	\$154,548.95	\$148,942.16

		CASH PAYMENT.	TRUE COST.
Amounts brought forward, -----	\$50.77	\$154,548.95	\$148,942.16
Coal, -----	34.20		
Lumber, -----	151.88		
Blacksmith work, -----	147.89	384.74	384.74

RUSH STREET BRIDGE.

Carpenter work, -----	\$183.59		
Lumber, -----	174.92		
Blacksmith work, -----	59.73		
Painting bridge and house. -----	513.87		
Coal, \$48.50, Repairs, \$5.75, -----	54.25		
Stove and pipe, -----	14.88		
Lantern, oil, and can, -----	7.25		
Two wheelbarrows, \$7.50, Tools, \$0.60, ---	\$8.10	1,016.59	
DEDUCT—			
Old iron sold, -----	\$551.28		465.31

STATE STREET BRIDGE.

Fox & Howard, amount of contract, -----	\$16,500.00		
“ extra work, -----	946.48		
Hardware for bridge house, -----	5.44		
Lumber, -----	56.79		
Paint and putty, -----	8.64		
Coal, -----	12.40	17,529.75	17,529.75

CLARK STREET BRIDGE.

Carpenter work, -----	\$457.93		
Lumber, -----	987.54		
Blacksmith and iron work, -----	76.90		
Castings, \$1.50, Latch, \$7.20, -----	8.70		
Nails and spikes, -----	52.00		
Ripping lumber, \$2.75, Glazing. \$0.50, ---	3.25		
Roofing bridge house, -----	6.75		
Coal, -----	29.20	1,622.27	1,622.27

WELLS STREET BRIDGE.

Carpenter work, -----	\$69.51		
Lumber, -----	551.21		
Blacksmith work, \$36.71, Signal, \$3.00, ---	39.71		
Amounts carried forward, -----	\$660.43	\$175,102.30	\$168,944.23

		CASH PAYMENT.	TRUE COST.
Amounts brought forward, -----	\$660.43	\$175,102.30	\$168,944.23
Castings, \$24.75, Two hose couplings, \$10.00, 34.75			
Tools, \$4.25, Lock and glazing, \$1.80, ----	6.05		
Repairing bridge approach, -----	264.10		
Repairs, \$7.25, Coal, \$19.60, -----	26.85		
Nails and spikes, -----	23.50	1,015.68	

ADD—

Old iron from Rush Street bridge, ---	\$15.86		1,031.54
---------------------------------------	---------	--	----------

LAKE STREET BRIDGE.

Carpenter work, -----	\$163.00		
Lumber, -----	717.48		
Blacksmith work, -----	25.04		
Oil, \$2.40, Signals, \$7.00, -----	9.40		
Labor on plate, \$3.00, Axe, \$2.00, -----	5.00		
Painting bridge, -----	223.25		
Castings, \$14.75, Hardware, \$1.12, -----	15.87		
Coal -----	30.20	1,189.24	1,189.24

RANDOLPH STREET BRIDGE.

L. B. Boomer, rebuilding bridge, -----	\$4,879.85		
Carpenter work, -----	12.18		
Lumber, -----	99.32		
Blacksmith work, -----	30.33		
Bottom plate, -----	434.19		
Fitting stringers, -----	48.50		
Sign, \$3.90, Repairs, \$0.75, -----	4.65		
Coal, -----	25.20	5,534.22	5,534.22

MADISON STREET BRIDGE.

Carpenter work, -----	\$57.49		
Lumber, -----	275.95		
Blacksmith work, -----	46.57		
Castings, -----	52.66		
Coal, \$30.20, Hardware, \$1.25, -----	31.45	464.12	464.12

VAN BUREN STREET BRIDGE.

Carpenter work, -----	\$36.13		
Lumber, -----	199.73		
Blacksmith work, -----	5.05		
Amounts carried forward, -----	\$240.91	\$183,305.56	\$177,163.35

		CASH PAYMENT.	TRUE COST.
Amounts brought forward,-----	\$240.91	\$183,305.56	\$177,163 35
Use of pile driver,-----	283.42		
Nails, and spikes, -----	8.50	567.03	
Coal, -----	34.00		
<hr/>			
ADD—			
Old iron from Rush Street bridge,-----	\$14.01		581.04
<hr/>			

POLK STREET BRIDGE.

Carpenter work, -----	\$43.06		
Nails and spikes,-----	129.95		
Blacksmith work,-----	66.01		
Rope, \$.080, Painting, \$1.00, Bell, \$6.00, -	7.80		
Coal, -----	31.38		
Hardware, \$4.67, Lamp burners, \$0.50,---	5.17		
Castings, -----	139.57		
Lumber, -----	73.10	496.04	496.04
<hr/>			

TWELFTH STREET BRIDGE.

Carpenter work, -----	\$93.94		
Lumber, -----	160.61		
Towing bridge to and from dry dock, ----	40.00		
Use of pile driver,-----	117.50		
Bolts and castings,-----	43.18		
Bell, \$8.00, Rope, \$0.81,-----	8.81		
Repairing and caulking,-----	400.38		
Hardware, \$3.50, Iron pump and plunge, \$11.50,-----	15.00		
Shaft and machine work,-----	25.78		
Nails and spikes,-----	25.18		
Blacksmith work, -----	8.26		
Coal, -----	17.40	956.04	956.04
<hr/>			

OLD STREET BRIDGE.

Carpenter work, -----	\$29.56		
Lumber, -----	72.52		
Blacksmith work, \$3.50, Glazing, \$2.75,--	6.25		
Bell, \$8.00, Coal, \$17.40, -----	25.40		
Roofing bridge house,-----	13.59	147.32	147.32
<hr/>			
Amounts carried forward, -----		\$185,471.99	\$179,343.79

	CASH PAYMENT.	TRUE COST.
Amounts brought forward,-----	\$185,471.99	\$179,343.79

HALSTED STREET BRIDGE.

Carpenter work,-----	\$5.50		
Bell, \$8.00, Nails and spikes, \$2.50, ----	10.50		
Lumber, \$8.00, Coal, \$16.80,-----	24.80		
Ripping and sawing lumber,-----	4.68	45.48	45.48

ARCHER ROAD BRIDGE.

Carpenter work, -----	3.00	3.00
-----------------------	------	------

REUBEN STREET BRIDGE.

Carpenter work, -----	\$3.63		
Lumber, -----	34.60	38.23	38.23

OFFICE EXPENSES AND SALARIES.

Salaries of Commissioners, -----	\$2,624.97		
Salary of Secretary, -----	800.00		
Salary of Engineer,-----	1,200.00		
Salary of Assistant Engineer,-----	500.00		
Salary of Assistant Superintendent,-----	450.00		
Salaries of Clerks, -----	2,998.01		
Draughtsmen,-----	339.99		
Blank books and stationery, -----	252.19		
Advertising and daily papers, -----	412.67		
Printing, including report April 1. 1864, -	301.60		
Office fixtures and repairs,-----	173.99		
Revenue Stamps,-----	63.06		
Painting and cleaning,-----	87.97		
Miscellaneous, -----	129.17	10,333.62	
DEDUCT—			
Expenses sundry special assessments, --	\$540.74		
Licenses and services of draughtsmen,--	23.60		
Oil cloth sold, -----	5.00		
	\$569.34		9,764.28

CHICAGO HARBOR.

Dredging and inspecting,-----	279.60		
Removing sunken boats and vessels, ----	342.99		
Sounding harbor,-----	152.84		
Amounts carried forward,-----	\$775.43	\$195,892.32	\$189,194.78

		CASH PAYMENT.	TRUE COST.
Amounts brought forward,-----	\$775.43	\$195,892.32	\$189,194.78
Carpenter work, -----	18.00		
Mud Lake survey,-----	10.00		
Labor on river wall,-----	30.00		
Repairs on wagon,-----	17.25		
Numbering leathers,-----	3.00	853.68	853.68

PUBLIC PARKS.

Trees, planting and labor on parks,-----	\$970.73		
Sprinkling in front of parks,-----	213.00		
Lumber, -----	76.66		
Nails and staples, -----	10.05	1,270.44	1,270.44

HOUSE NUMBERING.

Draughtsmen making maps of streets,-----	\$1,435.00		
Serving notices, -----	507.50		
Printing notices and applications,-----	193.30		
Drawing paper for maps,-----	78.75		
Clerks,-----	104.00		
Miscellaneous, -----	17.30	2,335.85	
DEDUCT—			
Amount received for numbers, -----	2,231.00		104.85

STRAIGHTENING NORTH CLARK STREET.

Damage allowed W. Barry,-----	60.00	60.00
-------------------------------	-------	-------

INTERSECTIONS OF STREETS.

Filling intersections on Wabash Avenue, -	\$465.18		
Grading " Milwaukee avenue, 1,222.28			
Macadamizing " Canal Street, -----	974.39		
Filling and paving " West Lake Street, 9,300.00			
Graveling " North Clark Street, 988.39			
Planking " West Twelfth Street, 196.38			
Grading " Market Street, bal-			
ance contract,-----	5.00		
Filling intersections on Kinzie and Wolcott			
Streets,-----	41.00		
Inspecting, -----	175.00		
Crossings at Canal Street intersections, ---	146.25		
Two wheelbarrows,-----	8.00	13,521.87	
Amounts carried forward,-----		\$213,934.16	\$191,483.75

	CASH PAYMENT.	TRUE COST.
Amounts brought forward, -----	\$213,934.16	\$191,483.75
ADD—		
Amount charged West Division,-----	\$87.52	13,609.39

CANAL STREET IMPROVEMENT.

Hervey Nash, on contract, per C., B., & Q.		
R. R. Co., -----	21,569.74	
Inspecting, -----	31.73	1,601.47

STREET LAMPS WEST DIVISION.

Rebates on erroneous assessments, -----	18.90
---	-------

NORTH PIER EXTENSION.

Advertising for proposals,-----	54.12	54.12
		<u>54.12</u>
Total cash expenditures, -----	\$215,608.65	\$205,147.26
Balance in Treasurer's hands, April 1, 1865,	44,828.76	
	<u>\$260,437.41</u>	

SPECIAL APPROPRIATIONS.

EXPENDITURES.

DREDGING BAR AT MOUTH OF HARBOR.

Fox & Howard, dredging,-----	\$22,700.35		
Inspecting, -----	389.00	\$23,089.35	\$23,089.35
	<hr/>		

NORTH PIER EXTENSION.

Fox & Howard, estimates,-----	\$27,946.16		
Sundry items,-----	116.70		
Inspecting, -----	37.50	28,100.36	
	<hr/>		

Add—

Advertising proposals, charged city appro- priation fund,-----	54.12		28,154.48
	<hr/>		<hr/>
		\$51,189.71	\$51,243.83
		<hr/>	<hr/>

SPECIAL ASSESSMENTS.

WEST LAKE STREET IMPROVEMENT.

Balance unexpended, April 1, 1864,-----		\$25,022.72
Estimates paid D. L. DeGolyer, -----	\$16,329.18	
Inspecting, -----	187.50	
Raising curb wall,-----	91.52	
	<hr/>	16,608.20
Balance unexpended, to apply on expenses,-----		<u>\$8,414.52</u>

CANAL STREET IMPROVEMENT.

Balance unexpended, April 1, 1864, -----		\$846.99
Estimate paid Giles & Nash,-----	\$649.25	
Inspecting, -----	168.60	
	<hr/>	817.85
Balance unexpended, -----		<u>\$29.14</u>

MILWAUKEE AVENUE IMPROVEMENT.

Balance unexpended, April 1, 1864, -----		\$5,782.96
Received from intersections and Cook Co.,-----		3,222.28
		<hr/>
Estimates paid J. McMahon, -----	\$5,682.31	
Services Inspector, -----	37.50	
	<hr/>	5,719.81
Balance unexpended, -----		<u>\$3,285.43</u>

HOLT STREET IMPROVEMENT.

Balance unexpended, April 1, 1864,-----		\$520.00
Damages paid, -----	\$495.00	
Error in assessment, -----	8.19	
	<hr/>	503.19
Balance unexpended, -----		<u>\$16.81</u>

FOURTEENTH STREET IMPROVEMENT.

Balance unexpended, April 1, 1864,-----	\$20,466.97	
Land Damages paid,-----	14,200.00	
	<hr/>	
Balance unexpended, -----		<u>\$6,266.97</u>

FOURTH ANNUAL REPORT OF

DREDGING SOUTH BRANCH, NEAR BRIDGEPORT.

Balance unexpended, April 1, 1864, -----	\$3,710.00	
Advertising for proposals for dredging,-----	20.63	
	<hr/>	
Balance unexpended, -----		\$3,689.37
		<hr/>

PLANKING WEST TWELFTH STREET.

Amount collected, -----	\$1,951.04
Lumber for planking,-----	1,951.04
	<hr/>

PRIVATE DRAIN ASSESSMENT.

Amount of assessment for private drain, lot 5, block 1, Johnston, Roberts, & Storr's Addition, -----		\$80.40
Error in assessment,-----	\$ 31.53	
Labor done by Sewarage Department, -----	26.69	
	<hr/>	58.22
		<hr/>
Balance unexpended, -----		\$22.18
		<hr/>

NORTH CLARK STREET IMPROVEMENT.

Balance unexpended, April 1, 1864, -----	\$965.30	
Received from intersections,-----	988.39	\$1,953.69
	<hr/>	
Abatements of tax paid,-----	608.81	
Land damages paid, -----	41.33	
	<hr/>	650.14
		<hr/>
Balance unexpended, -----		\$1,303.55
		<hr/>

DIVISION STREET IMPROVEMENT.

Amount of assessment for widening Division Street, from Clark Street to the Lake, -----	\$8,840.80
Land damages and abatements paid,-----	4,719.97
	<hr/>
Balance unexpended, -----	\$4,120.83
	<hr/>

TWENTIETH STREET IMPROVEMENT.

Amount of assessment,-----	\$37,695.00	
Land damages paid, -----	25,294.76	
	<hr/>	
Balance unexpended, -----		\$12,400.24
		<hr/>

LAMP POST ASSESSMENTS.

POLK STREET.

Balance unexpended, April 1, 1864,-----		\$146.87
Bouton & Co., balance for ten posts, -----	\$24.37	
Gas Co., in full, ten posts, -----	85.00	
F. Hartman & Co., balance, ten posts, -----	7.50	
Sundry expenses,-----	30.00	
	<hr/>	<hr/>
		\$146.87

JEFFERSON STREET.

Balance unexpended, April 1, 1864,-----		\$4.47
Bouton & Co., in full, for two posts, -----	\$4.87	
Gas Co., " " " -----	17.00	
F. Hartman, " " " -----	1.50	
	<hr/>	<hr/>
		23.37
Expended in excess of assessment,-----		\$18.90
		<hr/>

ST. JOHNS PLACE.

Balance unexpended, April 1, 1864, -----		\$96.00
Bouton & Co., one post, -----	\$16.25	
F. Hartman, in full, three lamps, -----	12.75	
	<hr/>	<hr/>
		29.00
Balance unexpended,-----		\$67.00
		<hr/>

JEFFERSON STREET.

Balance unexpended, April 1, 1864, -----		\$51.12
Bouton & Co., in full, six posts, -----	\$14.62	
People's Gas Light & C. Co., in full, service pipe, etc.,---	11.00	
F. Hartman, in full, six lamps, -----	7.50	
Sundry expenses, -----	18.00	
	<hr/>	<hr/>
		\$51.12

MATHER STREET.

Balance unexpended, April 1, 1864, -----		\$61.12
Bouton & Co., in full, six posts, -----	\$14.62	
People's G. L. & C. Co., in full, service pipe, etc.,---	21.00	
F. Hartman, in full, six lamps, -----	7.50	
Sundry expenses, -----	18.00	
	<hr/>	<hr/>
		\$61.12

FULTON STREET, BETWEEN PECK AND REUBEN

Balance unexpended, April 1, 1864,-----		\$160.00
Bouton & Co., in full, five posts,-----	\$81.25	
People's G. L. & C. Co., on account,-----	14.00	
F. Hartman, in full, five lamps,-----	21.25	
	<hr/>	116.50
Balance unexpended,-----		<hr/> <hr/> \$43.50

FULTON STREET, BETWEEN SANGAMON AND MORGAN.

Balance unexpended, April 1, 1864,-----		\$96.00
Bouton & Co., in full, three posts,-----	\$48.75	
People's G. L. & C. Co., in full, service pipe, etc.,---	25.50	
F. Hartman, in full, three lamps,-----	12.75	
Sundry expenses,-----	9.00	
	<hr/>	96.00
		<hr/> <hr/>

SANGAMON STREET.

Balance unexpended, April 1, 1864,-----		\$36.37
Bouton & Co., in full, two posts,-----	\$4.87	
People's G. L. & C. Co., in full, service pipe, etc.,---	17.00	
F. Hartman, in full, two lamps,-----	8.50	
Sundry expenses,-----	6.00	
	<hr/>	36.37
		<hr/> <hr/>

JACKSON STREET.

Balance unexpended, April 1, 1864,-----		\$44.75
Bouton & Co., balance, four posts,-----	\$9.75	
People's G. L. & C. Co., balance, service pipe, etc.,---	14.00	
F. Hartman, balance, four lamps,-----	9.00	
Sundry expenses,-----	12.00	
	<hr/>	44.75
		<hr/> <hr/>

WEST JACKSON STREET.

Balance unexpended, April 1, 1864,-----		\$48.44
Bouton & Co., balance, five posts,-----	\$12.19	
People's G. L. & C. Co., balance, service pipe, etc.,---	17.50	
F. Hartman, balance, five lamps,-----	3.75	
Sundry expenses,-----	15.00	
	<hr/>	48.44
		<hr/> <hr/>

SHELDON STREET.

Balance unexpended, April 1, 1864, -----		\$19.38
Bouton & Co., balance, two posts, -----	\$4.88	
People's G. L. & C. Co., balance, service pipe, -----	7.00	
F. Hartman, balance, two lamps, -----	1.50	
Sundry expenses, -----	6.00	
	<hr/>	19.38
		<hr/>

TAYLOR STREET.

Balance unexpended, April 1, 1864, -----		\$86.31
Bouton & Co., balance, seven posts, -----	\$17.06	
People's G. L. & C. Co., balance, service pipe for four posts, -----	14.00	
F. Hartman, balance, seven lamps, -----	8.75	
	<hr/>	39.81
		<hr/>
Balance unexpended, -----		46.50
		<hr/>
		<hr/>

WEST ADAMS STREET, BETWEEN CANAL AND HALSTED.

Balance unexpended, April 1, 1864, -----		\$267.63
Bouton & Co., balance, fourteen posts, -----	\$34.13	
People's G. L. & C. Co., in full, for pipe, for six posts, -----	21.00	
F. Hartman, balance, sixteen lamps, -----	47.00	
	<hr/>	102.13
		<hr/>
Balance unexpended, -----		\$165.50
		<hr/>
		<hr/>

WEST ADAMS STREET, BETWEEN RUCKER AND MORGAN.

Balance unexpended, April 1, 1864, -----		\$79.34
People's G. L. & C. Co., balance, service pipe, -----	\$28.00	
F. Hartman, balance, eight lamps, -----	11.00	
	<hr/>	39.00
		<hr/>
Balance unexpended, -----		\$40.34
		<hr/>
		<hr/>

CLINTON STREET.

Balance unexpended, April 1, 1864, -----		\$232.50
Bouton & Co., balance, twenty-four posts, -----	\$58.50	
People's G. L. & C. Co. balance, service pipe, -----	84.00	
F. Hartman, balance, for twenty-four lamps, -----	18.00	
Sundry expenses, -----	72.00	
	<hr/>	232.50
		<hr/>
		<hr/>

PEORIA STREET.

Balance unexpended, April 1, 1864, -----		\$24.38
Bouton & Co., balance, two posts, -----	4.88	
People's G. L. & C. Co., balance, service pipe, -----	7.00	
F. Hartman, balance, two lamps, -----	6.50	
Sundry expenses, -----	6.00	
	<u> </u>	<u>24.38</u>

LOOMIS STREET.

Balance unexpended, April 1, 1864, -----		\$58.13
Bouton & Co., balance, six posts, -----	\$14.63	
People's G. L. & C. Co., balance, service pipe, -----	21.00	
F. Hartman, balance, six lamps, -----	4.50	
Sundry expenses, -----	18.00	
	<u> </u>	<u>58.13</u>

WEST LAKE STREET.

Balance unexpended, April 1, 1864, -----		\$454.69
Bouton & Co., balance, twenty-five posts, -----	\$60.94	
F. Hartman, in full, twenty-five lamps, -----	106.25	
	<u> </u>	<u>167.19</u>
Balance unexpended, -----		<u>\$287.50</u>

DESPAINES STREET.

Balance unexpended, April 1, 1864, -----		\$150.00
Bouton & Co., balance, seventeen posts, -----	\$55.25	
People's Gas L. & C. Co., balance, service pipe, -----	59.50	
F. Hartman, balance, sixteen lamps, -----	12.00	
	<u> </u>	<u>126.75</u>
Balance unexpended, -----		<u>\$23.25</u>

WARREN STREET.

Balance unexpended, April 1, 1864, -----		\$272.22
Bouton & Co., balance, seventeen posts, -----	\$41.43	
People's Gas L. & C. Co., service pipe, -----	49.00	
F. Hartman, balance, twenty lamps, -----	36.00	
Rebate to C. C. James, -----	13.96	
	<u> </u>	<u>140.39</u>
Balance unexpended, -----		<u>\$131.83</u>

ABERDEEN STREET

Balance unexpended, April 1, 1864, -----		\$41.36
Bouton & Co., balance, four posts, -----	\$9.76	
People's Gas L. & C. Co., service pipe for two posts, --	7.00	
F. Hartman, balance, four lamps, -----	10.00	
	<hr/>	26.76
Balance unexpended, -----		<hr/> <hr/> \$14.60

JUDD STREET.

Balance unexpended, April 1, 1864, -----		\$48.44
Bouton & Co., balance, five posts, -----	\$12.19	
People's Gas L. & C. Co., service pipe, etc., -----	17.50	
F. Hartman, balance, five lamps, -----	3.75	
Sundry expenses, -----	15.00	
	<hr/>	\$48.44
		<hr/> <hr/>

TWELFTH STREET.

Balance unexpended, April 1, 1864, -----		\$96.00
Bouton & Co., in full, three posts, -----	\$48.75	
People's G. L. & C. Co., in full, for service pipe, etc., --	25.50	
F. Hartman, in full, three lamps, -----	12.75	
Sundry expenses, -----	9.00	
	<hr/>	96.00
		<hr/> <hr/>

DEPUYSTER STREET.

Balance unexpended, April 1, 1864, -----		\$29.06
Bouton & Co., balance three posts, -----	\$7.31	
People's G. L. & C. Co., balance, service pipe, etc., --	10.50	
F. Hartman, balance, three posts, -----	2.25	
Sundry expenses, -----	9.00	
	<hr/>	29.06
		<hr/> <hr/>

WEST VAN BUREN STREET, BETWEEN HALSTED AND DESPLAINES STREET.

Balance unexpended, April 1, 1864, -----		\$38.75
Bouton & Co., balance, four posts, -----	\$9.75	
People's G. L. & C. Co., balance for service pipe, ---	14.00	
F. Hartman, balance, four lamps, -----	3.00	
Sundry expenses, -----	12.00	
	<hr/>	38.75
		<hr/> <hr/>

WEST VAN BUREN STREET, BETWEEN SANGAMON AND 175 FEET WEST MORGAN STREET.

Balance unexpended, April 1, 1864,-----		\$32.10
Bouton & Co., balance, four posts,-----	\$9.75	
People's G. L. & C. Co., balance, for service pipe, etc.,	14.00	
F. Hartman, balance, four lamps,-----	3.00	
Sundry expenses,-----	5.35	
	<hr/>	<hr/>
		\$32.10

WEST TWELFTH STREET.

Balance unexpended, April 1, 1864,-----		\$160.00
Bouton & Co., in full, two posts,-----	\$32.50	
People's G. L. & C. Co., in full, service pipe, &c., for five posts,-----	42.50	
F. Hartman, in full, five lamps,-----	21.25	
	<hr/>	<hr/>
		96.25
Balance unexpended,-----		<hr/>
		\$63.75

PRICE PLACE.

Balance unexpended, April 1, 1864,-----		\$38.75
Bouton & Co., balance, four lamps,-----	\$9.75	
People's G. L. & C. Co., balance, service pipe, etc.	14.00	
F. Hartman, balance, four lamps,-----	3.00	
Sundry expenses,-----	12.00	
	<hr/>	<hr/>
		38.75

PARK AVENUE.

Balance unexpended, April 1, 1864,-----		\$72.75
Bouton & Co., balance, four lamps,-----	\$9.75	
People's G. L. & C. Co., in full, service pipe,-----	34.00	
F. Hartman, in full, four lamps,-----	17.00	
Sundry expenses,-----	12.00	
	<hr/>	<hr/>
		\$72.75

HALSTED STREET.

Balance unexpended, April 1, 1864,-----		\$130.88
Bouton & Co., balance, ten posts,-----	\$24.38	
People's G. L. & C. Co., balance, service pipe, etc.,--	55.00	
F. Hartman, balance, ten lamps,-----	21.50	
Sundry expenses,-----	30.00	
	<hr/>	<hr/>
		130.88

WEST MONROE STREET.

Balance unexpended, April 1, 1864,-----		\$237.62
Bouton & Co., balance, fourteen posts,-----	\$34.12	
People's G. L. & C. Co., service pipe, etc.,-----	7.00	
F. Hartman, balance, fourteen lamps,-----	52.50	
	<hr/>	93.62
Balance unexpended,-----		<u><u>\$144.00</u></u>

CARPENTER STREET.

Balance unexpended, April 1, 1864,-----		\$54.54
Bouton & Co., balance, three posts,-----	\$7.29	
People's G. L. & C. Co., service pipe for two posts,--	17.00	
F. Hartman, in full, three lamps,-----	12.75	
	<hr/>	37.04
Balance unexpended,-----		<u><u>\$17.50</u></u>

CARROLL STREET.

Balance unexpended, April 1, 1864,-----		\$272.81
Bouton & Co., fifteen posts,-----	\$36.56	
People's G. L. & C. Co., in full, for service pipe, etc.,	127.50	
F. Hartman, in full, fifteen lamps,-----	63.75	
Sundry expenses,-----	45.00	
	<hr/>	272.81

BLUE ISLAND AVENUE.

Balance unexpended, April 1, 1864,-----		\$104.31
Bouton & Co., balance, six posts,-----	\$14.62	
People's G. L. & C. Co., in full, for service pipe,---	51.00	
F. Hartman, in full, for six lamps,-----	25.50	
Sundry expenses,-----	13.19	
	<hr/>	104.31

WILLARD PLACE.

Balance unexpended, April 1, 1864,-----		\$29.38
Bouton & Co., balance, two posts,-----	\$4.88	
People's G. L. & C. Co., in full, for service pipe,---	17.00	
F. Hartman, balance, for two lamps,-----	1.50	
Sundry expenses,-----	6.00	
	<hr/>	<u><u>\$29.38</u></u>

PRAIRIE AVENUE.

Balance unexpended, April 1, 1864, -----		\$24.75
Bouton & Co., balance account, for posts, -----	\$19.50	
F. Hartman, balance, for four posts, -----	3.00	
Sundry expenses, -----	2.25	
	<hr/>	<hr/>
		24.75

EIGHTEENTH STREET.

Balance unexpended, April 1, 1864, -----		\$83.06
F. Hartman, balance, for sixteen lamps, -----		12.00
		<hr/>
Balance unexpended, -----		\$71.06
		<hr/>

HARMON COURT.

Balance unexpended, April 1, 1864, -----		\$64.00
Bouton & Co., in full, for two posts, -----	\$32.50	
F. Hartman, in full, for two lamps, -----	8.50	
	<hr/>	<hr/>
		41.00
Balance unexpended, -----		\$23.00
		<hr/>

GROVE STREET.

Balance unexpended, April 1, 1864, -----		\$80.00
Bouton & Co., in full, for three posts, -----	\$48.75	
F. Hartman, balance, for four lamps, -----	3.00	
	<hr/>	<hr/>
		51.75
Balance unexpended, -----		\$28.25
		<hr/>

MICHIGAN AVENUE.

Balance unexpended, April 1, 1864, -----		\$22.44
Bouton & Co., balance account for posts, -----	\$18.69	
F. Hartman, balance, for five lamps, -----	3.75	
	<hr/>	<hr/>
		22.44

MICHIGAN AVENUE.

Amount of assessment, for eleven lamp posts, between Eighteenth and Twenty-second Streets, -----		\$352.00
B. W. Phillips, one lamp and post, -----	\$32.00	
Bouton & Co., in full, for eleven posts, -----	264.00	
	<hr/>	<hr/>
		296.00
Balance unexpended, -----		\$56.00
		<hr/>

WEST WATER STREET.

Amount of assessment, for lamp posts, between Kinzie and West Indiana Streets,-----	\$224.00
People's G. L. & C. Co., service pipe for nine posts, -	76.50
Balance unexpended, -----	<u>\$147.50</u>

WEST WASHINGTON STREET.

Amount of assessment, for lamp posts, between Wood and Lincoln Streets,-----	\$128.00
Bouton & Co., in full, for four posts,-----	96.00
Balance unexpended,-----	<u>\$32.00</u>

WEST WASHINGTON STREET.

Amount of assessment, for deficiency for lamp posts, between Wood and Lincoln Streets, -----	\$40.00
People's G. L. & C. Co., in full, for service pipe, etc.,	34.00
Balance unexpended,-----	<u>\$6.00</u>

WEST WASHINGTON STREET.

Amount of assessment, for lamp posts, between Jefferson Street, and 100 feet west of Clinton Street,--	\$90.00
A. E. Bishop, one lamp and post,-----	41.00
Balance unexpended,-----	<u>\$49.00</u>

CHICAGO AVENUE.

Amount of assessment, for lamp posts, between Wolcott and Green Bay Streets,-----	\$192.00
Bouton & Co., in full, for six posts,-----	97.50
Balance unexpended,-----	<u>\$94.50</u>

NORTH DEARBORN STREET.

Amount of assessment for lamp posts between Maple and Division Streets,-----	\$128.00
Bouton & Co., in full, for two posts,-----	\$32.50
Ira Scott, rebate,-----	11.08
E. S. Wadsworth, rebate,-----	15.72
Balance unexpended,-----	<u>\$68.70</u>

INDIANA AVENUE.

Amount of assessment for lamp posts from 60 ft. south of 25th St. to 60 ft. north of 29th St.,-----	\$320.00
Bouton & Co., in full, for ten posts,-----	240.00
	<hr/>
Balance unexpended,-----	\$80.00
	<hr/>

PRAIRIE AVENUE.

Amount of assessment, for two lamp posts, 250 feet north of 22d Street,-----	\$84.00
Bouton & Co., in full, for two posts,-----	48.00
	<hr/>
Balance unexpended,-----	\$36.00
	<hr/>

SIDEWALKS.

BONFIELD STREET.

Amount of assessment for sidewalk bet. Archer Road and Hickory Street,-----	\$36.00
S. Bieson, constructing walk,-----	24.00
	<hr/>
Balance unexpended,-----	\$12.00
	<hr/>

HICKORY STREET.

Amount of assessment for sidewalk bet. Mary and Deering Streets,-----	\$87.60
S. Bieson, constructing walk,-----	73.00
	<hr/>
Balance unexpended,-----	\$14.60
	<hr/>

ARCHER ROAD.

Amount of assessment for sidewalk, lot 4, block 21, sec. 29, 39, 14,-----		\$74.70
B. Bartelme, constructing walk,-----	\$26.95	
Chas. Fieldkamp, rebate,-----	25.25	
T. Linkenfeld, "-----	26.15	78.35
	<hr/>	<hr/>
Expended in excess of assessment,-----		\$3.65
		<hr/>

MICHIGAN AVENUE.

Amount of assessment for walk 40 ft. south of River Street,-----	\$87.00
B. Bartelme, constructing walk,-----	52.00
	<hr/>
Balance unexpended,-----	\$35.00
	<hr/>

RIVER STREET.

Amount of assessment for walk,-----	\$185.00
B. Bartelme, constructing walk,-----	150.00
Balance unexpended,-----	<u>\$35.00</u>

CARL STREET.

Amount of assessment for sidewalk, sub-lots 10 & 11, Bronson's Addition,-----	\$60.95
B. Bartelme, constructing walk,-----	26.95
Balance unexpended,-----	<u>\$34.00</u>

NORTH LASALLE STREET.

Assessment for walk bet. Division St. and North Ave.,	\$24.75
J. King, rebate,-----	\$12.37
B. Bartelme, constructing walk,-----	12.38 \$24.75

SEDGWICK STREET.

Assessment for walk between Huron Street and Chi- cago Avenue,-----	\$173.00
B. Bartelme, constructing walk,-----	152.10
Balance unexpended,-----	<u>\$20.90</u>

SUPERIOR STREET.

Assessment for walk between Market and Kingsbury Streets, -----	\$100.13
B. Bartelme, constructing walk,-----	<u>\$100.13</u>

TWOMEY STREET.

Amount of assessment for walk from Sedgwick Street west to its terminus,-----	\$54.60
B. Bartelme, constructing walk,-----	37.80
Balance unexpended,-----	<u>\$16.80</u>

GRANGER STREET.

Assessment for walk between Wells and Sedgwick Streets, -----	\$11.25
B. Bartelme, constructing walk,-----	<u>\$11.25</u>

FOURTH ANNUAL REPORT OF

ELSTON ROAD.

Assessment for walk between North Avenue and Waubansia Avenue,-----		\$382.22
Pat. O'Keef, rebate,-----	\$11.00	
W. H. Donovan, constructing walk,-----	110.00	121.00
	<hr/>	
Balance unexpended,-----		\$261.22
		<hr/> <hr/>

DIVISION STREET AND CLYBOURNE AVENUE.

Amount of assessment for sidewalk, -----		\$32.50
B. Bartelme, relaying walk, -----		\$32.50
		<hr/> <hr/>

GRACE AND DIVISION STREETS.

Amount of assessment for sidewalk,-----		\$117.50
B. Bartelme, relaying walk, -----		\$117.50
		<hr/> <hr/>

DIVISION, VINE, AND LARRABEE STREETS.

Amount of assessment for sidewalk, -----		\$136.50
J. Johnson, relaying walks, -----	\$8.80	
B. Bartelme, " " -----	127.70	
	<hr/>	
		\$136.50
		<hr/> <hr/>

CHICAGO AVENUE AND KINGSBURY STREET.

Amount of assessment for walk,-----		\$604.20
B. Bartelme, relaying walk, -----		\$604.20
		<hr/> <hr/>

NORTH CLARK STREET.

Amount of assessment for sidewalk, lot 34, Bron- son's Addition,-----		\$24.75
B. Bartelme, relaying walk, -----		\$24.75
		<hr/> <hr/>

MICHIGAN AVENUE.

Amount of assessment for sidewalk,-----		\$18.00
S. Bieson, relaying walk,-----		\$18.00
		<hr/> <hr/>

FOURTH AVENUE.

Amount of assessment for sidewalk,-----		\$48.68
W. B. H. Gray, rebate,-----	\$32.45	
S. Bieson, relaying walk,-----	16.23	
	<hr/>	
		\$48.68
		<hr/> <hr/>

FOURTH AVENUE.

Amount of assessment for sidewalk,-----	\$15.00
S. Bieson, relaying walk,-----	\$15.00

ARNOLD STREET.

Amount of assessment for sidewalk,-----	\$76.00
S. Bieson, constructing walk,-----	55.00
Balance unexpended,-----	\$21.00

ARCHER ROAD.

Amount of assessment for sidewalk,-----	\$70.00
R. McCabe, rebate,-----	\$71.50
Expended in excess of assessment, -----	\$1.50

PRAIRIE AVENUE.

Amount of assessment for sidewalk,-----	\$69.50
S. Bieson, constructing walk,-----	49.50
Balance unexpended,-----	\$20.00

McGLASHEN STREET.

Amount of assessment for sidewalk,-----	\$89.50
S. Bieson, constructing walk,-----	52.00
Balance unexpended,-----	\$37.50

MAIN STREET.

Amount of assessment for sidewalk,-----	\$82.50
S. Bieson, constructing walk,-----	62.50
Balance unexpended,-----	\$20.00

WALNUT STREET.

Amount of assessment for sidewalk,-----	\$102.75
B. Bartelme, constructing walk,-----	68.75
Balance unexpended,-----	\$34.00

WEST LAKE STREET.

Amount of assessment for sidewalk,-----	\$276.50
S. Sawyer, relaying walk,-----	77.20
Balance unexpended,-----	\$199.30

CLINTON STREET.

Amount of assessment for sidewalk,-----	\$109.30
B. Bartelme, relaying walk,-----	79.30
	<hr/>
Balance unexpended,-----	\$30.00
	<hr/> <hr/>

POLK STREET.

Amount of assessment for sidewalk,-----	\$15.00
E. Corning, rebate,-----	\$15.00
	<hr/> <hr/>

WEST MADISON STREET.

Amount of assessment for sidewalk,-----	\$195.70
B. Bartelme, relaying walk,-----	195.70
	<hr/> <hr/>

WEST TWELFTH STREET.

Amount of assessment for sidewalk,-----	\$180.00
B. Bartelme, constructing walk,-----	160.00
	<hr/>
Balance unexpended,-----	\$20.00
	<hr/> <hr/>

BARBER STREET.

Amount of assessment for sidewalk,-----	\$220.00
B. Bartelme, constructing walk,-----	213.75
	<hr/>
Balance unexpended,-----	\$6.25
	<hr/> <hr/>

ABERDEEN STREET.

Amount of assessment for sidewalk,-----	\$59.20
B. Bartelme, constructing walk,-----	\$59.20
	<hr/> <hr/>

CANAL STREET.

Amount of assessment for sidewalk,-----	\$425.91
B. Bartelme, constructing walk,-----	361.45
	<hr/>
Balance unexpended,-----	\$64.46
	<hr/> <hr/>

SIDEWALK IMPROVEMENT, LAFLIN'S SUB-DIVISION.

Amount of assessment for sidewalk,-----	\$53.80
B. Bartelme, relaying walk,-----	\$53.80
	<hr/> <hr/>

SIDEWALK IMPROVEMENT, ASSESSORS' DIVISION.

Amount of assessment for sidewalk,-----	\$100.00
B. Bartelme, relaying walk,-----	\$100.00
	<hr/> <hr/>

KRAMER STREET.

Amount of assessment for sidewalk, -----	\$32.00
B. Bartelme, constructing walk,-----	22.50
	<hr/>
Balance unexpended, -----	\$9.50
	<hr/>

* BLUE ISLAND AVENUE.

Amount of assessment for sidewalk, -----	\$104.31
B. Bartelme, constructing walk,-----	73.20
	<hr/>
Balance unexpended, -----	\$31.11
	<hr/>

THROOP STREET.

Amount of assessment for sidewalk, -----	\$173.55
B. Bartelme, constructing walk,-----	151.80
	<hr/>
Balance unexpended, -----	\$21.75
	<hr/>

MORGAN STREET.

Amount of assessment for sidewalk, -----	\$246.35
B. Bartelme, constructing walk,-----	120.00
	<hr/>
Balance unexpended, -----	\$126.35
	<hr/>

WEST JACKSON STREET.

Amount of assessment for sidewalk, -----	\$46.00
F. Reid, rebate, -----	\$11.61
B. Bartelme, constructing walk,-----	23.00
	<hr/>
	34.61
Balance unexpended, -----	\$11.39
	<hr/>

WEST MONROE STREET.

Amount of assessment for sidewalk,-----	\$67.80
B. Bartelme, constructing walk,-----	53.40
	<hr/>
Balance unexpended, -----	\$14.40
	<hr/>

LIBERTY STREET.

Amount of assessment for sidewalk, -----	\$46.00
B. Bartelme, constructing walk, -----	45.00
	<hr/>
Balance unexpended, -----	\$1.00
	<hr/>

SIDEWALK IMPROVEMENT, BLOCK 10, ASSESSORS' DIVISION.

Amount of assessment for sidewalk, -----		\$26.40
B. Bartelme, relaying walk, -----	\$22.55	
S. W. Grannis, rebate, -----	4.23	
	<hr/>	<hr/>
		26.78
Expended in excess of assessment, -----		
		<hr/>
		<hr/>
		\$0.38

APPENDIX.

REPORT OF THE COMMISSION OF ENGINEERS,
APPOINTED BY THE
COMMON COUNCIL OF THE CITY OF CHICAGO,
JANUARY 9, 1865,
TO REPORT UPON THE BEST PLAN FOR CLEANSING
CHICAGO RIVER.

*To the Hon. Mayor and Common Council of the
City of Chicago, Illinois:—*

The undersigned having been duly notified that they were, on the 9th of January, 1865, appointed a board of commission to devise the best plan for cleansing the Chicago river, and having carefully considered the questions involved in this important subject, have the honor to submit the following report:—

Knowing that various modes of purifying the river had been proposed by gentlemen of intelligence, having a direct interest in the subject, we resolved to avail ourselves, as far as practicable, of their opinions. Accordingly at our first meeting, we caused a notice to be published, requesting all persons who had formed any plans for effecting the object in view to present them, with the necessary explanations. In response to this request a great number of communications were received—some of them containing valuable suggestions and showing that much thought had been bestowed upon the important questions involved.

We here desire to express our thanks to the parties who so kindly and promptly came forward to assist us in the solution of a difficult problem, and especially to those who had devoted much time to the preparation of elaborate plans and estimates.

We do not deem it necessary to discuss, in this report, the merits of the various plans and suggestions which we have considered. Suffice it to say that, at our different meetings, we have endeavored to fully and impartially consider all their various merits and defects, and to give them all the weight to which, in our judgment, they were justly entitled.

These communications more or less directly bear upon three general plans which seem to be the only ones through which the main object in view can be accomplished, to wit:—

1. Intercepting sewers which shall receive the filth that would otherwise flow into the river and carry it to the lake, to some point or points into which it would be pumped by machinery—thus keeping impurities out of the river to as great an extent as practicable.

2. Cutting canals or making covered sewers from the two branches of the river to the lake, and, by pumping works erected thereon force the filthy water out or the lake water in, thus keeping up a constant and sufficient current to keep the river pure. We do not believe that the necessary current can be produced by the natural action of the waves of the lake, as has been suggested.

3. Cutting down the summit of the Illinois and Michigan canal below the level of the lake, so that a sufficient quantity of water may be drawn from it to create the necessary current though the main river and the south branch (and perhaps, to some extent in the north branch also) to thoroughly purify the same at all times.

Without recapitulating all the arguments which have been urged for and against these three general plans, it may be sufficient to briefly state a few of the prominent advantages and disadvantages of each.

We believe the system of intercepting sewers has not been introduced anywhere in America as yet, and into but few cities of the old world, where it has scarcely had a thorough trial yet, but is said to be steadily growing in favor. It seems to us that the system is more particularly adapted to older cities, where stringent municipal regulations can be more easily carried out,

and where other facilities for getting rid of offensive matter are less available than here.

It is believed that its advantages would consist in receiving and conducting, in covered sewers, to a point or points outside of the city, the filthy contents of all the sewers that now discharge into the main river and branches, and thus prevent the water of the river, and from it the atmosphere of the city, from being polluted as at present. It would also allow the lowest districts of the city, which are now partially flooded in times of high water in the lake, to be drained better than can be done at present.

Besides the first cost of construction, upwards of \$1,000,000, and the length of time, not less than two years required to carry it out, the system of intercepting sewers would be subject to the disadvantages which necessarily belong to so complicated a scheme. At the outlet it would be necessary to construct, and keep in operation night and day, pumping works, to raise and discharge into the lake the constantly increasing filth of the city. Along the river and branches self-acting gates, or valves, would have to be constructed with great care in the first place, and forever after maintained with unceasing faithfulness.

Should intercepting sewers be constructed for the purpose of receiving the discharges from distilleries, packing houses, and other establishments that have rendered the river offensive, it is to be feared that it would only remove the nuisance from the river to more vital points. The experience of the city thus far in the maintenance of its sewers shows that, while the men employed in cleaning have never been injuriously affected by ordinary house drainage, they cannot stand the emanations from substances improperly and unlawfully discharged into the sewers from packing houses or rendering establishments. It would be exceedingly difficult if not impracticable to prevent the effluvia caused by such establishments, as well as distilleries, from pervading all the sewers of the city, and causing serious complaints where no annoyances are now felt.

Should it be found best ultimately to carry out a system of intercepting sewers in Chicago, and we are by no means prepared

to say it will not, we think there would finally be a necessity for keeping up a constant current in the river, because it would be impossible to prevent the discharge of improper substances into it from the shipping, the docks, and sewers themselves, in times of heavy rain, to say nothing of what might be thrown into the north and south branches outside of the limits and jurisdiction of the city, and afterwards brought within by a sluggish current.

In regard to the second general plan, we think that there can be no doubt that it can be made to accomplish the main object desired at a less expense at the outset than any other. To do this in the most effectual way we would adopt the following specific plan, to-wit:—

An open canal from the south branch to the lake through or near Douglas avenue; length 13,700 feet, width at bottom 25 feet, at surface at low water of Lake Michigan 65 feet, and depth 10 feet. Estimated cost \$547,230.

Also an open canal, of the same dimensions as above, from the north branch of Chicago river to the lake, through or near Fullerton avenue. Length 11,200 feet; and estimated cost \$469,269.

These canals would have a capacity sufficient to discharge 24,000 cubic feet of water per minute, each (without raising it more than four inches), which, it is supposed, would change the entire volume of water in the river once in forty-eight hours. The machinery for pumping might be placed either upon the river or lake ends of the canals.

The advantages of this plan consist mainly in its simplicity, the comparative cheapness of construction, and the facility with which repairs could at any time be made.

Its disadvantages would be found in the constant expense of sustaining and operating the machinery, keeping the canals in repair, protecting and keeping open their entrances into the lake, and contingencies to which works of this kind are more or less liable. These can, however, be provided against in a degree, by duplicating the machinery. Another objection to both this and the intercepting sewer plan is, that all the accumulated filth of the city must be discharged within or near its limits.

The estimated cost of the third plan for purifying Chicago river, which is to cut down the summit of the canal below the level of the lake, so as to draw from it, at a low stage, not less than 24,000 cubic feet of water per minute, is \$2,102,467.50.

This estimate provides for increasing the capacity of the canal somewhat over the plan adopted by the canal commissioners in 1836, so as to create a current in Chicago river which is deemed sufficient to cleanse it. The quantity of water drawn from the lake through the river would seldom be less than 24,000 cubic feet per minute, and at the average stage of water much greater.

The advantages of this plan over any other are briefly as follows:—

1. It furnishes the only possible self-acting means of cleansing the main river and the south branch (and possibly to a certain extent the north branch also), every hour of the day and every day of the year for all time to come.

2. The filth of the city which passes into the river will be drained off through the canal without contaminating the waters of the lake, and the continual current will prevent the water in the river from ever becoming very offensive.

3. The cost of construction will be the only expense to the city, as all subsequent expenses in keeping the channel open and enlarging and improving it will be borne by the State.

4. The money expended in cutting down the summit of the canal so as to procure the supply of water directly from Lake Michigan, will constitute a part of the expense of enlarging the present canal so as to admit the passage of steamboats of the largest class,—an improvement which must soon be made.

5. By using the present summit locks, or, if the canal be enlarged, constructing other locks at each end of the “deep cut” of enlarged dimensions, a large quantity of water could be accumulated at any time by filling the canal to the present surface, which could be suddenly discharged into Chicago river making a strong current to the lake. This may never be necessary, but the plan admits of the arrangement described, should it hereafter be deemed desirable.

We have mentioned the prominent advantages of the plan.

The principal disadvantages are its cost and the time which must be occupied in doing the work. The probable cost has been given. The time which would be required to execute the work economically, without seriously interfering with the navigation of the present canal, would be about three years.

But no other plan by which the river could be effectually purified could be executed in less than one year; so, for a year, at least, some means within reach must be adopted to partially remedy the evils which it is intended ultimately to entirely obviate.

It is believed that the hydraulic works at Bridgeport if worked up to their full capacity, or even so as to raise all the water which the present canal, with some slight addition to its banks, could discharge, would prevent the river from becoming very offensive if especial vigilance were exercised to keep out deleterious substances. This we deem of the utmost importance, and, in fact, indispensable to the well-being of the city until some plan of thorough drainage be carried out.

Even then, it appears to us, that the distilleries which have, at times, rendered the waters of the north branch almost putrid, and other establishments which have given Chicago a world-wide fame for its vile odors, should not be permitted to remain the nuisances which they have been. Certainly the process of thoroughly cleansing the river would be greatly simplified if no more offensive substances were discharged into it than could possibly be avoided. It would seem to be the part of wisdom as much to avoid an evil, if possible, as to cure it.

Until some plan for cleansing the river be fully completed, it should not be expected that the temporary remedies which may be resorted to will entirely prevent the water from becoming impure. They will only mitigate the evil.

The recommendation has frequently been made that the Desplaines river should be turned into either the south or north branch, and thus purify it; but at the very season when the process would be most needed there is not water enough in that river to do any good, and if there was the city has no right to take it. But it is said that that river would furnish in times of freshet

water enough to scour the south branch and main river two or three times a year so thoroughly that it could not become very offensive in the meanwhile, and would also be kept in a far better navigable condition. As a measure of satisfactory relief from nuisances in the river, we believe it would not answer the purpose. As an important aid in maintaining a suitable depth in the harbor, we think it might be made valuable; but after careful examinations and surveys we are thoroughly satisfied that the small expenditures heretofore recommended for the purpose would be totally inadequate. Some of us have had actual experience in matters of this kind, and we believe that a canal that would cost less than \$100,000 would only end in disappointment. To this sum should be added whatever it might cost to dredge out deposits in the river below Bridgeport, brought in from the canal.

The commission has made the proposed survey of Desplaines river with reference to a new channel from Bridgeport to Lockport, independent of the Illinois and Michigan canal, which was referred to us by your honorable body. We have found, as was expected, very extensive deep places in the channel of the river, but notwithstanding this it would cost upwards of \$1,000,000 more to make a new channel of equal size to that of the Illinois and Michigan canal from Bridgeport to the Desplaines, and thence down that stream to Lockport, than it would to deepen the present canal. The new channel after being completed would be encumbered with the drainage of the Desplaines valley; but the present canal deepened would not.

In case it should be thought advisable to construct the proposed canals between the lake and the north and south branches, the question of power to be used becomes an important one. We do not, at present, feel perfect confidence in anything but steam; but the experience of several of the railroad companies of this State in the use of wind-mills is so satisfactory, and withal so economical in first cost and maintenance, that it might be worthy of a trial, and we think it far more promising than reliance upon the action of waves, because these could only be depended upon during northerly or easterly winds, while wind-

mills could take advantage of any breeze. There is also another natural power that could be made use of, and that is a species of tide or ebb and flow occurring sometimes as often as once in ten minutes in the calmest days of summer. The cause of this ebb and flow has never been satisfactorily explained, to our knowledge, but of its existence there is no doubt, and as little that by means of self-acting gates it could be utilized for changing the water in the proposed canals, to some extent at least, if not to a sufficient one for permanent benefit.

The suggestion has been made that reservoirs could be constructed on the north branch of the Desplaines, and a sufficient quantity of water stored in them to flush the river occasionally. This could undoubtedly be done, but a slight investigation of the subject will show the impossibility of obtaining from such sources a supply sufficient to keep the river pure at all times, unless at a cost greatly exceeding other methods; and as the value of but two or three flushings during the season is so doubtful, when compared with a constant purification, we do not think it advisable to construct such reservoirs.

In view of all the facts of the case, the best plan for cleansing Chicago river that we can devise, is to cut down the summit of the canal so as to draw a sufficient quantity through it from the lake to create the necessary current in said river.

We are aware that the first cost of executing this work would exceed that of constructing short canals from the north and south branches to the lake and erecting the necessary machinery thereon. We are aware also that, theoretically, the interest on the additional cost would be more than the expense of operating said machinery. But we do not think that in deciding this question we have a right to disregard other considerations of great importance to the interests of the city, especially the law passed at the recent session of our State legislature which gives the city of Chicago a lien upon the Illinois and Michigan canal and its revenues after the payment of the present canal debt, until the whole cost of making the "deep cut" and the interest accruing thereon shall have been reimbursed to the city.

With regard to the north branch, while we consider the proposed open canal from the lake to the river along or near Fullerton avenue, the best plan to recommend for permanently cleansing it, if the discharge of filth into it must be suffered to go on as heretofore, we believe it is both the right and the duty of the city to prevent all such discharges. This would be by far the simplest, cheapest, and quickest way of purifying that branch; in fact, the only method we can think of to obtain immediate as well as permanent relief.

It has often been said within the last three years, that any effectual prohibitions of such discharges would drive the distilleries from the city and thus inflict a serious blow upon its prosperity. By an act of congress, of last year, such heavy taxes were imposed upon distilled liquors as to cause the stoppage of these distilleries last July. But one has resumed work since, and that within the last two months. As a result the north and northwestern portions of the city have enjoyed unusual freedom from nuisances, which were often before of a most abominable character, while no complaints of any injury to the general growth or prosperity of the city have been heard of.

The proposed canal on or near Fullerton avenue would cost, as already stated, about \$500,000 and probably not less than \$20,000 annually afterwards to maintain it, particularly if steam power should be required. It would be better for the city to pay now at least \$500,000, should that be necessary, to prevent the north branch from being polluted, than to construct and maintain this canal, whatever may be the final necessity for keeping up an artificial current in the said branch. We believe the true policy of the city is to prevent all nuisances, as far as possible, from being made, and then the unavoidable ones will be comparatively easy to remedy. The proposed canal would probably encourage and increase, to a very great extent, filthy discharges into it and the river from establishments that would be, most probably, nuisances of themselves to their neighborhoods.

The present sewerage system of the city has been planned and thus far carried out at some additional inconvenience and

considerable expense, with reference to keeping the north branch as free as possible from pollution, for the purpose of avoiding the heavy expense that would otherwise be required to purify it. Up to this time there is but one sewer, and that only a few blocks long, on Chicago avenue, that discharges constantly into the north branch. The West Kinzie Street sewer discharges into it during heavy rains only. The probability is that, for many years to come, the amount of sewage it may be necessary to discharge into that branch would not be sufficient to cause offensiveness, if the establishments above-mentioned, as well as similar ones, can be prevented from discharging their filth into it.

All which is respectfully submitted.

(Signed)

WM. GOODING,
R. B. MASON,
JOHN VAN NORTWICK,
E. B. TALCOTT,
E. S. CHESBROUGH,
F. C. SHERMAN,

Chicago, March 6, 1865.

AN ACT to provide for the completion of the Illinois and Michigan Canal upon the plan adopted by the State in 1836.

Whereas, It has been represented that the City of Chicago, in order to purify or cleanse Chicago river, by drawing a sufficient quantity of water from Lake Michigan directly through it and through the summit division of the Illinois and Michigan canal, would advance a sufficient amount of funds to accomplish this desirable object; and,

Whereas, The original plan of the said canal was to cut down the summit so as to draw a supply of water for navigation directly from Lake Michigan, which plan was abandoned for the time being after a large part of the work had been executed, only in consequence of the inability of the State to procure funds for its further prosecution; and,

Whereas, Under the law creating the trust, the plan of the summit division of the canal was changed, the level being raised so as to require the principal supply of water to be obtained through the Calumet feeder, subject to serious contingencies, and by pumping on to the summit with the hydraulic works at Bridgeport; now, therefore,

SECTION 1. *Be it enacted by the People of the State of Illinois, represented in the General Assembly:* That to secure the completion of the summit division of the Illinois and Michigan canal, upon the original "deep cut" plan, with such modifications and change of line, if necessary, as will most effectually secure the thorough cleansing or purification of the Chicago river, and facilitate the execution of the work, the City of Chicago, through its constituted authorities, may at once enter into an arrangement with the board of trustees of said canal with a view to the speedy accomplishment of the work.

SEC. 2. The canal shall not be constructed of a less capacity than the plan adopted by the canal commissioners in 1836, nor shall the work of deepening it be prosecuted so as to materially interfere with the navigation. By consent of the board of trustees, however, the navigation may be opened later and closed earlier than usual in former years, but it shall never be diminished to a less time than six months.

SEC. 3. It shall be lawful for the City of Chicago to enter upon and use any lands which may be necessary for the right of way for said canal, if the route should in any part vary from the present line of canal, and to take and use any materials of any description necessary for the prosecution of the work contemplated along the line thereof, the value of the same to be determined in the mode provided by the general laws of this State.

SEC. 4. The amount expended by the City of Chicago in deepening the summit division of the canal, according to the plan adopted by the canal commissioners in 1836, shall be a vested lien upon the Illinois and Michigan canal and its revenues, after the payment of the present canal debt, and the next

revenue of the canal shall all thereafter be applied to the payment of the principal and interest of the same expended in accomplishing the object of this act, until the whole amount is reimbursed to the city. *Provided*, the cost shall not exceed two and a half millions of dollars.

SEC. 5. The State of Illinois may at any time relieve this lien upon the canal and revenue, by refunding to the City of Chicago the amount expended in making the contemplated improvement and the interest thereon.

(Signed)

ALLEN C. FULLER,
Speaker of the House.

(Signed)

WM. BROSS,
Speaker of the Senate,

Approved Feb. 16, 1865. RICH. J. OGLESBY.

United States of America, State of Illinois, ss.—I, Sharon Tyndale, Secretary of State of the State of Illinois, do hereby certify that the foregoing is a true copy of an enrolled law now on file in my office. In witness whereof, I have hereunto set my hand, and affixed the great seal of state, at the City of Springfield, this twenty-third day of February, A.D., 1865.

{ Seal of the State }
{ of Illinois. }

SHARON TYNDALE,
Secretary of State.

[U.S. 5 cent revenue stamp.]

TD
25
C5
A3
4th (1865)
RARE
BKRM

